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PUSH-PULL CIRCUIT ARRANGEMENT FOR ULTRA-SHORT WAVES

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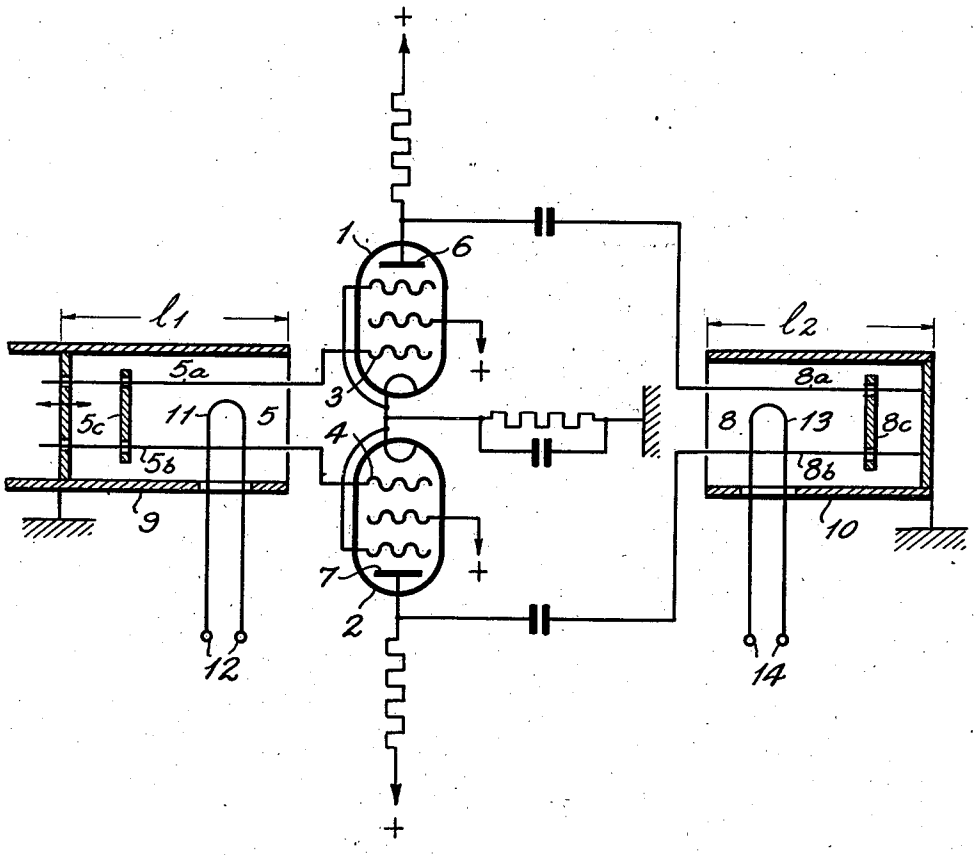

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PUSH-PULL CIRCUIT ARRANGEMENT FOR ULTRA-SHORT WAVES

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3 Claims. (Cl. 179—171)

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This movement relates to a circuit arrangement for ultra short waves, in which use is made of a resonant circuit substantially consisting of two juxtaposed and parallel conductors.

To avoid undesired coupling of such a resonant circuit and the other parts of the arrangement, it is known to surround the conductors of the resonant circuit with screening means which are earthed in regard to high frequency currents.

When making use of shielded resonant circuits of the type referred to above in push-pull circuit arrangements, which comprise such a shielded resonant circuit both in the input circuit and in the output circuit, we have found that disturbing oscillation phenomena frequently occur.

According to the invention, this drawback is avoided in push-pull circuit arrangements by taking care that the natural frequency of the system included in the input circuit, constituted by the parallel conductors jointly and the screening means, differs from the natural frequency of the corresponding system included in the output circuit.

The invention will be more fully explained by reference to the accompanying drawing, which represents a push-pull amplifying circuit according thereto.

In the drawing, 1 and 2 designate push-pull connected amplifying tubes whose control grids 3, 4 are respectively connected to the ends of a resonant circuit 5 consisting of two juxtaposed parallel conductors 5*a*, 5*b* and a movable short circuit bridge 5*c*; the anodes 6, 7 are respectively coupled with the ends of a resonant circuit 8 included in the output circuit of the arrangement, the last mentioned circuit being constituted by the parallel conductors 8*a*, 8*b* and the short-circuit bridge 8*c* which is also movable.

Each of the resonant circuits 5 and 8 is surrounded by earthed screening means 9 and 10, respectively, to which one end of the conductors 5*a*, 5*b* and 8*a*, 8*b*, respectively, is electrically connected. The oscillations to be amplified are supplied, for instance, through the intermediary of a coupling loop 11 having terminals 12, to the circuit 5 included in the input circuit of the arrangement, and the amplified oscillations may be derived in an analogous manner from the resonant circuit 8 interposed in the output circuit through the intermediary of a coupling loop 13 having terminals 14. As is schematically represented in the drawing, direct current feed voltages are supplied to the electrodes of the tubes 1 and 2; this has not been further illustrated, since it is not essential to the present invention.

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In push-pull circuit arrangements of the type referred to above, undesirable oscillation phenomena may occur which are brought about as follows: The input circuit of the arrangement, as well as the output circuit, comprises the resonant circuit 5 and 8, respectively, and in addition a resonant system constituted by the two parallel conductors 5*a*, 5*b* and 8*a*, 8*b* jointly, and the envelopes 9 and 10, respectively. In regard to the two last-mentioned systems, the tubes 1 and 2 are not connected in push-pull but in parallel, as a result of which the mutual conductance of this system is materially higher than that of the push-pull arrangement and oscillation of the arrangement (for instance due to the control-grid anode capacity) may readily occur in the form of construction represented. The frequency of the oscillations thus produced corresponds to the natural frequency of the resonant systems constituted by the resonant circuit conductors jointly and the screening means associated therewith.

According to the invention, these disturbing phenomena can be avoided by causing the natural freuqency of the system connected in the input circuit and constituted by the conductors 5*a*, 5*b* and the screening means 9 to differ from the natural frequency of the corresponding resonant system 8, 8*a*, 8*b* and 10 in the output circuit of the push-pull arrangement, which can be achieved in a simple manner, for instance by making the length l_1 of the shrielding envelope 9 different from the length l_2 of the shielding envelope 10, the construction and dimensions of the screened resonant circuit included in the input and output circuits being otherwise the same.

To attain the purpose aimed at, it is also possible, of course, to make use of other means known per se for the obtainment of definite tuning of such a resonant system essentially consisting of two parallel conductors. Thus, for example, the electric length of one of the screens, with equal metric length thereof, can be controlled by the interposition of capacities or inductances.

Of course, the invention applies not only to push-pull circuit arrangements for amplifying electrical oscillations but also, for instance, to push-pull arrangements for producing or mixing electrical oscillations; in the last-mentioned case, for instance, in a superheterodyne receiving set, the resonant circuits constituted by the parallel conductors 5*a*, 5*b* and 8, 8*a*, 8*b*, will be tuned respectively to the frequency of the local oscillations and the frequency of the incoming oscillations.

What is claimed is:

1. A push-pull circuit arrangement for ultra short waves, in which the input and output circuits each comprise a resonant circuit substantially consisting of two identically dimensioned juxtaposed and parallel conductors surrounded by metallic screening means, and in which the natural frequency of the system included in the input circuit and constituted by the parallel conductors jointly with the screening means is different from the natural frequency of the corresponding system included in the output circuit.

2. An ultra short wave amplifier system comprising a pair of electron discharge devices each having an input electrode and an output electrode, a tuned lecher wire circuit coupled to the input electrodes of said devices, and a tuned lecher wire circuit coupled to the output electrodes of said devices, a shield surrounding each of said tuned lecher wire circuits, each shield being connected to the tuned circuit it surrounds and cooperating therewith to form a resonant system, said shields being sufficiently differently dimensioned to cause said resonant systems to have different natural frequencies, whereby the occurrence of disturbing parasitics due to interacting between input and output circuits are avoided.

3. An ultra short wave push-pull system comprising a pair of multi-electrode electron discharge devices, each having a control grid and an anode, a pair of similarly dimensioned parallel conductors connected at one end to the control grids of said devices, a short-circuiting slider bridging said conductors, a metallic sleeve-like shield surrounding said parallel conductors for substantially their entire length, a connection from ground to said shield, and another pair of parallel conductors connected at one end to the anodes of said devices, a short-circuiting slider bridging said last pair of conductors, a metallic sleeve-like shield surrounding said last pair of parallel conductors, and a connection from said last shield to ground, said shields being differently dimensioned, whereby the natural frequency of the circuit comprising the first mentioned pair of parallel conductors jointly with their surrounding shield is different from the natural frequency of the circuit comprising the second mentioned pair of conductors jointly with their surrounding shield.

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