

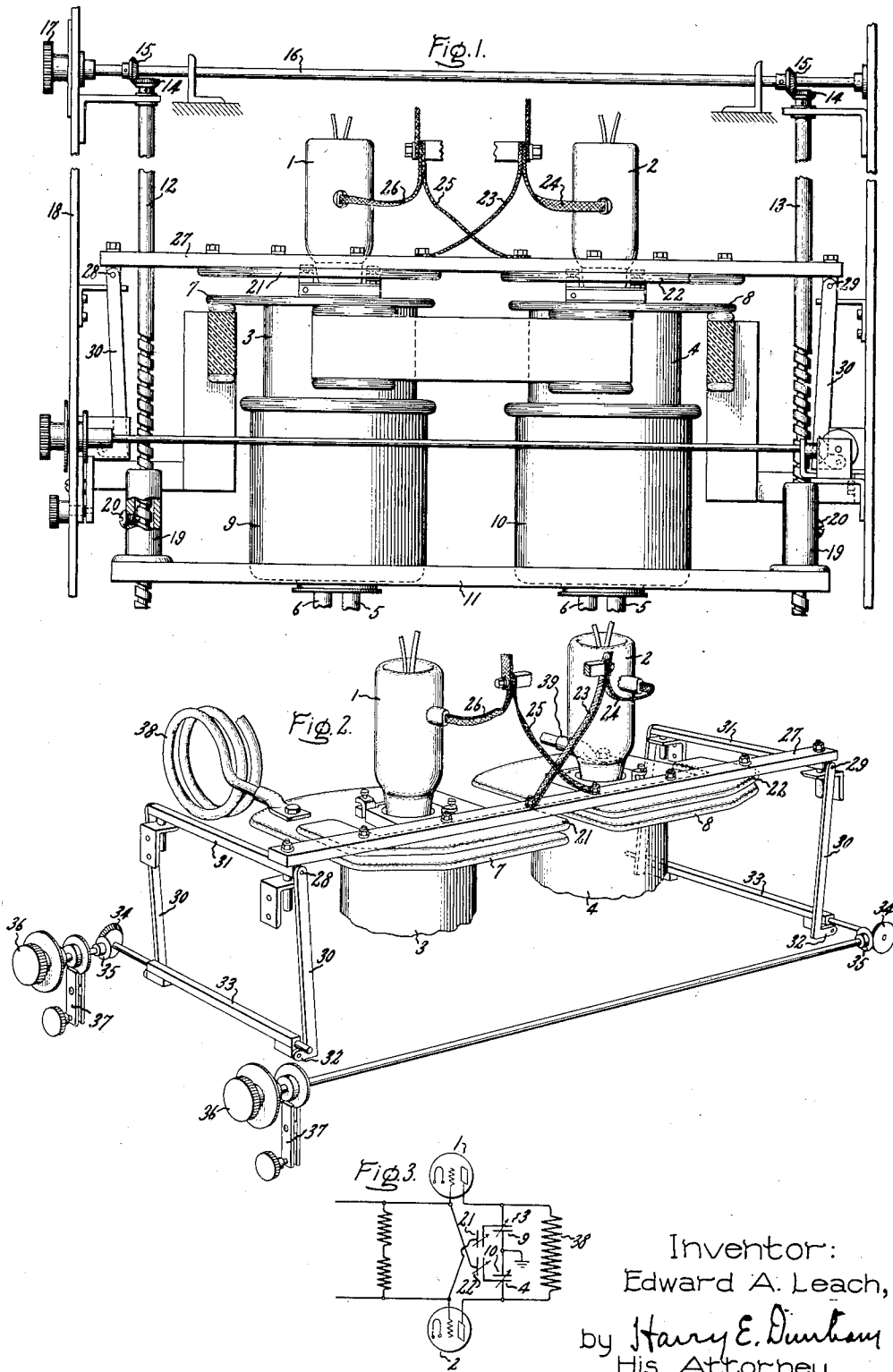
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CONDENSER ASSEMBLY

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CONDENSER ASSEMBLY

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6 Claims. (Cl. 250—16)

My invention relates to condenser constructions and more particularly to condenser constructions for use in balanced circuit arrangements such as push pull electron discharge circuits.

One of the objects of my invention is to provide a condenser assembly which may be extremely economically constructed and in which each of the different condensers is readily adjustable.

In push pull electron discharge circuit arrangements commonly a plurality of pairs of condensers are employed including tuning condensers and neutralizing condensers. One of the objects of my invention is to provide a neutralizing condenser construction for such an assembly of condensers whereby the neutralizing of the apparatus may be effected in an extremely economical and satisfactory way. Another object of the invention is to provide a neutralizing condenser construction in which the different neutralizing condensers are readily adjustable.

The novel features which I believe to be characteristic of my invention are set forth with particularity in the appended claims. My invention itself, however, both as to its organization and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawing in which Figs. 1 and 2 are different representations of an embodiment of my invention; and Fig. 3 is a schematic representation of the circuits involved.

Referring to the drawing, I have shown in Fig. 1 thereof a pair of electron discharge devices 1 and 2 which are connected in push pull, or balanced, relation. These discharge devices may be of the liquid cooled type in which the cooling jackets are arranged within cylindrical members 3 and 4, the cooling fluid being caused to flow through the water jackets by means of inlet and outlet pipes 5 and 6 indicated below each of the discharge devices. Because of the high electric field existent in the neighborhood of these pipes they are preferably of glass. The cylinders 3 and 4 enclosing the cooling jackets of the discharge devices are conductively connected to these cooling jackets and are hence maintained at the anode potential of the discharge devices. These cylinders, together with the horizontal plates 7 and 8 arranged at the top thereof and preferably made integral therewith, comprise fixed electrodes for both the tuning condensers and also the neutralizing condensers of the apparatus. The tuning condensers comprise addi-

tional cylindrical electrodes 9 and 10 arranged about the fixed cylindrical electrodes 3 and 4. These additional cylindrical electrodes 9 and 10 are mounted upon a common conducting plate 11 which is arranged by means of screw threaded members 12 and 13 for adjustment in a vertical plane. Each of the screw threaded members 12 and 13 is provided at its upper end with a bevel gear 14, each of which engages a bevel gear 15 on a shaft 16 which is rotatable by means of a knob 17 which is arranged on the panel 18 of the housing of the apparatus. They also each pass through cylindrical members 19 which are rigidly secured to the common supporting member 11. These cylindrical members are provided with screws 20 which engage the threaded portion of the members 12 and 13 to cause the supporting member 11 to move upwardly and downwardly in response to rotation of the knob 17. In this way the cylindrical members 9 and 10 are varied in position with respect to the members 3 and 4 thereby to vary the capacitance between the members 3 and 9, and 4 and 10 in unison. The member 11 is, of course, maintained at ground potential in any suitable way, as for example, through the conductivity of members 12 and 13 which are secured to the grounded frame of the apparatus. The condensers 3, 9 and 4, 10 thus comprise the tuning capacitance of the push pull circuit, the inductance of the push pull circuit being connected between the members 3 and 4 of these condensers in a manner later to be indicated.

The neutralizing condensers of the transmitter comprise the plates 7 and 8 and plates 21 and 22 arranged respectively adjacent thereto. The plate 21 is connected through a conductor 23 with the grid terminal 24 of the discharge device 2, and similarly the plate 22 is connected through a conductor 25 with the grid terminal 26 of the discharge device 1. Thus since the plates 7 and 8 are connected to the anodes of their respective discharge devices the capacitance between plates 7 and 21 forms a neutralizing condenser connected between the anode of the discharge device 1 and the grid of the discharge device 2, and similarly the capacitance between plates 8 and 22 forms a neutralizing condenser between the anode of discharge device 2 and the grid of discharge device 1.

Plates 21 and 22 are mounted upon a common non-conducting supporting member 27 extending across the apparatus. This member is pivoted at each end as indicated at 28 and 29 and each end is arranged for vertical movement by means

of member 30. Thus by vertical movement of either end of the member 27 the respective end may be rotated about the pivot at the opposite end of the member. In this way either of the neutralizing condensers may be varied in capacity without variation in capacitance of the other.

The means whereby this adjustment may be effected is better illustrated in Fig. 2 in which the member 27 is shown as mounted upon transverse bars 31 at each end of the apparatus. These bars are pivoted in the upper ends of the members 30. The lower ends of the members 30 are provided with an arm 32 the outward end of which is pivotally attached to a shaft 33 in such a way that upon rotation of the shaft the arms 32 are rotated about the center of the shaft 33 thereby causing the members 30 to be moved upwardly or downwardly dependent upon the direction of rotation of the shaft. These shafts 33 are provided with bevel gears 34 which engage additional bevel gears 35 which in turn are controlled by knobs 36 mounted upon the control panel of the apparatus.

Thus by rotation of the knobs 36 the two neutralizing condensers 7, 21 and 8, 22 may be varied as desired to effect the desired neutralizing adjustment of the apparatus. It will be observed that rotation of one of the knobs 36 while the other remains in position will cause one of the neutralizing condensers to be varied through a wide range while the other is varied through but a small range. In the event that it is desired to vary one of the neutralizing condensers without variation of the other, this may of course be effected by rotation of one of the knobs in one direction while rotating the other knob in the opposite direction, thereby raising one end of the bar 27 while the other is lowered. Thus through this rocking of the member 27 a position may be found in which the apparatus is exactly neutralized. When so adjusted the knobs 36 may be held in position by means of clamps indicated at 37 on the drawing.

The connection of the tuning inductance with the apparatus is also shown in Fig. 2, this inductance comprising a coil 38 which is connected to the plate 7 and hence to the anode of the discharge device 1. The opposite end of this inductance is connected to the plate 8 as indicated by the terminal 39, the coil being broken away to avoid complication of the drawing.

The circuit arrangement of the apparatus indicated in Figs. 1 and 2 is schematically indicated in Fig. 3 in which discharge devices 1 and 2 are represented in the conventional way with the inductance 38 connected between the two anodes thereof. Tuning condenser 3, 9 is represented as being connected between the anode of discharge device 1 and ground and similarly the tuning condenser 4, 10 is represented as being connected between the anode of discharge device 2 and ground. The neutralizing condensers between the anode of each discharge device and the grid of the other are also indicated by the reference numerals 21 and 22.

By pivoting the non-conducting supporting member 27 at each end and arranging it to rock in the manner described, the use of any supporting members within the high electric field adjacent to and between the discharge devices is obviated, thereby eliminating any undesired capacity effects which might result if the member 27 were, for example, pivoted to such a support at the center. The neutralizing condensers, it will be observed, are of extremely simple construction

comprising merely the plates mounted upon this member 27 in adjacency to the fixed electrodes of the tuning condensers.

While I have shown a particular embodiment of my invention, it will of course be understood that I do not wish to be limited thereto since many modifications in the mechanical construction and in the instrumentalities employed may be made, and that I contemplate by the appended claims to cover any such modifications as fall within the true spirit and scope of my invention as set forth in the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In combination, a plurality of electron discharge devices, means connecting said discharge devices in push pull relation, a variable neutralizing condenser for each of said discharge devices, each of said neutralizing condensers including a movable plate, said movable plates being mounted on a common control member at different points spaced apart longitudinally of said control member, and means for adjusting the position of either end of said control member.

2. In combination, a plurality of condensers, each of said condensers having a fixed electrode and a variable electrode, said variable electrodes being mounted on a common control member and spaced apart longitudinally of said control member, and means for varying the position of either end of said control member relative to the fixed electrode of the adjacent condenser.

3. In combination, a plurality of condensers, each of said condensers having a fixed electrode and a variable electrode, said variable electrodes being mounted on a common control member and spaced apart longitudinally of said control member, said control member being pivoted at a plurality of points and adjustable at each of said points for rotation about another of said points whereby the capacity of either condenser may be varied through a wide range while the capacity of the other condenser is varied through a relatively small range.

4. In combination, a plurality of discharge devices mounted in push pull relation, a pair of fixed condenser electrodes, one of said electrodes being mounted adjacent each of said discharge devices, a variable electrode adjacent each of said fixed electrodes, a common supporting member for said variable electrodes, said common supporting member being pivoted at a plurality of points and adjustable at each of said points for rotation about the pivot at another point.

5. In combination, a plurality of electron discharge devices, means connecting said discharge devices in push pull relation, said means comprising neutralizing condensers and a tuning capacitance, said tuning capacitance comprising a pair of fixed electrodes, each fixed electrode being mounted adjacent one of said discharge devices, a pair of tuning electrodes, each tuning electrode being mounted adjacent one of said fixed electrodes, and means to vary said tuning electrodes in position with respect to said fixed electrodes and in unison, and said neutralizing condensers comprising a pair of neutralizing electrodes, each neutralizing electrode being mounted adjacent one of said fixed electrodes, a common support for said neutralizing condenser electrodes, and means so to adjust said support as to produce substantial variation in capacitance between either of said neutralizing condenser electrodes and the adjacent fixed electrode while maintaining substantially constant capacitance

between the other neutralizing condenser electrode and its adjacent fixed electrode.

6. In combination, a plurality of electron discharge devices, means connecting said discharge devices in push pull relation, said means comprising a pair of fixed condenser electrodes mounted in parallel planes, a neutralizing electrode mounted on one side of each of said fixed electrodes and a tuning electrode mounted on the side of each of said fixed electrodes opposite said neutralizing electrode, means to vary said tuning electrodes in unison, and means to vary either

of said neutralizing electrodes to vary the capacitance between it and the respective fixed electrode while maintaining substantially constant the capacity between the opposite neutralizing electrode and its respective fixed electrode, said last means comprising a common control member having said neutralizing electrodes spaced apart longitudinally thereon, and means to adjust the position of either end of said common control member relative to the respective fixed electrode.

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