Nov. 6, 1928. 1,690,676

P. E. GILLING

RADIO VACUUM TUBE CONDENSER

Filed July 14, 1927

Fig. 1.

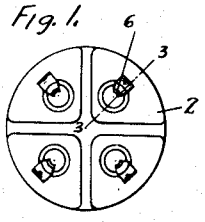


Fig. 2.

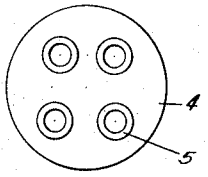


Fig. 3.

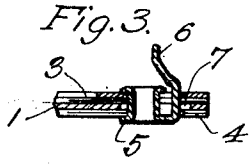


Fig. 4.

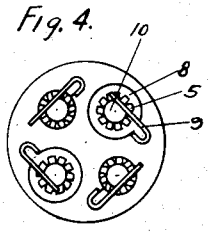


Fig. 5.

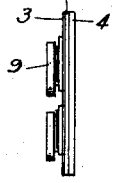


Fig. 6.

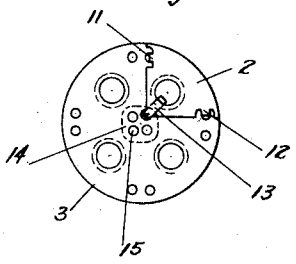


Fig. 7.

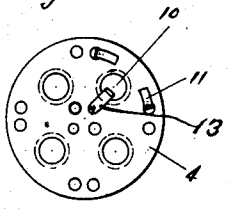


Fig. 8.

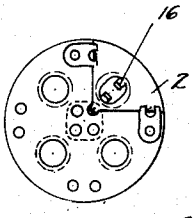


Fig. 9.

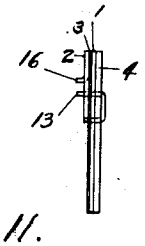


Fig. 10.

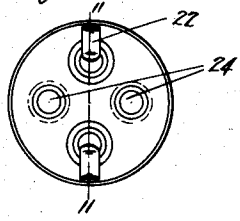
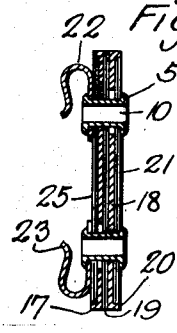


Fig. 11.



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UNITED STATES PATENT OFFICE.

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RADIO VACUUM TUBE CONDENSER.

Application filed July 14, 1927. Serial No. 205,550.

This invention relates to the design of a special form of an electrical condenser. It is now a well-known fact that in the audion tube which in its most common form comprises a plate, grid, and filament with four terminals leading thereto, there is a certain electrical capacity between the elements of the tube particularly that of the plate and grid, and on account of this inherent capacity of the tube electrical oscillations are passed back from the plate to the grid, producing a "feed back" or regenerative action. These effects are manifested in several ways, as by squeals, and howls produced by the tubes.

Numerous circuits have been designed in an endeavor to overcome this "ill effect" and radio receiving sets embodying such effects are generally known to the trade as neutrodyne, tuned radio frequency, and so forth. However, due to the fact that tubes vary in their inherent capacity, a set which may be fully "neutralized" for a given set of tubes may be entirely unbalanced or "de-neutralized" when one or more of the tubes are changed, so that it is necessary for the user to readjust or retune the entire set, and this is not always practicable, or possible.

It is therefore the principal object of my invention to provide a unitary device, which may carry one or a plurality of low capacity condensers, such that the same may be slipped over the terminals of the vacuum tube. These unitary devices or condenser assemblies are relatively simple and cheap to manufacture, and consequently a user can have several on hand for the purpose of quickly balancing up his set, even though he may not actually change the tubes.

Keeping this principal object in mind my invention will be readily understood after reading the specification taken in connection with the annexed drawing, wherein Figure 1 is a plan view of one form of a unitary condenser structure. Figure 2 is a view of the reverse side of Figure 1, while Figure 3 is a section on the line 3—3 of Figure 1. Figure 4 is a plan view of a modified form of my unitary condenser structure. Figure 5 is a side view of Figure 4, Figure 6 is a plan view of a further modified form of construction, but showing only one condenser element mounted on the support plate. Figure 7 is a view of the back of Figure 6. Figure 8 is a plan view of a further modified form, somewhat similar to Figure 6. Figure 9 is a side view of Figure 8. Figure 10 is a plan view of a further modified form, while Figure 11 is a vertical sectional view through Figure 10.

As shown in Figures 1 to 3 inc. 1 is a support plate preferably of metal, on which is mounted, a plurality of metal sectors 2, which are insulated from the plate, by a thin insulator 3, preferably of mica. On the back of plate 1 is carried an insulator 4, which is held to the plate 1, by eyelets 5. The eyelets 5, are each provided with a resilient contact tongue 6, preferably made integral with the eyelet, and in order to provide good contact, with the tube terminals, the eyelets are assembled so each tongue thereof starts from the end of the eyelet adjacent plate 1, and passes through a clearance hole 7 in said plate to a point above the opposite end of the eyelet and in alignment with the hole through the eyelet. As shown in Figures 1 and 2, there are 4 of the sectors 2, each fastened to the plate 1, by its associated eyelet in the manner just described. Thus, there is provided on the support plate 1, a plurality of condensers of low capacity, the condenser action being between the plates 2 and the plate 1.

As shown in Figure 4, the eyelet 5 acts to grip a washer 8 which preferably has integral with it, a contact tongue 9, that extends over the hole 10 through which the tube terminal passes. As shown in Figure 4, the condenser effect between opposite pairs of the eyelets and their associated parts is different due to a larger washer 8. As shown in Figure 6 the sector 2, only one of which is illustrated is provided with a plurality of fingers 11, 12 and 13, which fingers pass through clearance holes in the support plate 1, and are bent over the insulator 4. As shown in Figure 7, the finger 13, in addition to gripping the insulator 4, passes upward through the hole 10, thereby forming a tube terminal engaging means. As shown in Figure 6, by the dotted line 14, the plate 1, is cut away to provide clearance for the fingers 13, which pass through the holes 15, provided in the dielectric insulator 3, and the outer insulator 4.

As shown in Figure 8 the sector 2 is constructed very similar to that shown in Figure 6, but in addition has an integral contact lug

16, thrown outward to assist with the end of the finger 13, in making contact with the tube terminal. In Figures 10 and 11 there are two metallic plates 17 and 18, separated by a dielectric insulator 19, preferably of mica. The plate 18 has preferably a rim 20 within which fits an insulator 21, while the plate 17 carries an insulator 25. The plates 17 and 18 with the insulators 19, 21 and 25 are held together by eyelets 5, on one side of which is carried a bent terminal tongue 22, which extends over the hole 10 in the eyelet 5. One of the terminals 22 is electrically connected with the plate 17, while the other terminal 23 with its associated eyelet is electrically connected with the plate 18. Another pair of eyelets 24 is merely used to bind the parts securely together and are not in electrical contact with either of the plates 17 and 18.

The unitary condenser structures above described are adapted to readily slip over the terminals of a radio vacuum tube of the audion type and from what has been said it will be understood that the condenser may be placed on the tube so as to change the capacity across any pair of tube terminals, when a condenser structure is used having a different capacity between the different sectors or terminals thereof.

By having a condenser of low capacity which may be easily and quickly slipped over the terminals of a vacuum radio tube, it is readily seen that the potentials applied to the various tube elements which tend to produce the "ill effect" previously referred to may be shunted around these elements and the tube or tubes "balanced". In certain types of circuits a grid leak and condenser is used which is a separate device requiring time for mounting and wiring up. My invention for a quick detachable condenser for the tube terminals eliminates this extra condenser, and the work associated with it.

It is apparent from what has gone before that my invention is susceptible of numerous changes in details without departing from the spirit of my invention and the scope of the appended claims.

Having thus described my invention what I claim is:

1. A condenser to fit over the terminals of a radio vacuum tube, comprising; a plate having holes therethrough to pass the tube terminals, a dielectric carried by the plate, metallic members positioned on the dielectric and fastened to the same and to the plate but insulated from each other, said members having holes registering with the holes in the plate and means for insuring that at least two of said metallic members will be in electrical contact with the particular tube terminals going through said members.

2. A condenser to fit over the terminals of a radio vacuum tube, comprising; a plate having holes therethrough to pass the tube terminals, a dielectric carried by the plate, metallic members positioned on the dielectric and fastened to the same and to the plate but insulated from each other, said members having holes registering with the holes in the plate, and at least one resilient clip connected with at least two of the metallic members for insuring a good contact with the particular tube terminal going through said members.

3. A condenser to fit over the terminals of a radio vacuum tube, comprising; a metallic plate having clearance holes therethrough for the tube terminals, an insulator disc covering one side of said plate, a dielectric covering the other side of the plate, metallic members positioned on the dielectric, an eyelet for each of said metallic members going through the insulator disc, the dielectric and its associated metallic member forming a plurality of low capacity condensers and spring clips connected with said metallic members for insuring a good contact with the particular tube terminal going through said metallic member.

4. A device to slip over the terminals of a radio vacuum tube, consisting of a plurality of low capacity condensers assembled on a mounting plate having openings therethrough for the tube terminals and means connected with each condenser for completing electrical contact with a tube terminal, when the terminals are passed through said plate openings.

5. A device to slip over the terminals of a radio vacuum tube, consisting of a plate having openings therein for the tube terminals, at least one condenser assembled on the plate and means connected with the condenser for completing electrical contact with a pair of tube terminals when the tube terminals are pushed through the holes in the plate.

6. A unitary device to slip over the terminals of a radio vacuum tube consisting of a plurality of condensers of different capacity assembled on a mounting plate having openings therethrough for the tube terminals and means connected with each condenser for completing electrical contact with a tube terminal when the terminals are passed through said plate openings.

7. For use with a radio vacuum tube having a plurality of elements with terminals therefor, said elements having an inherent capacity therebetween; quick detachable means for connecting an external capacity across said tube terminals consisting of; a plurality of condensers of low and different capacity assembled on a mounting plate, said plate having holes therethrough spaced so the tube terminals may be passed through any desired hole whereby the capacity across a given pair of terminals may be changed and means connect-

ed with each condenser for completing an electrical contact with the tube terminals as they are passed through said holes.

8. For use with a radio vacuum tube having a plurality of elements with terminals therefor, said elements having an inherent capacity therebetween; means assisting in neutralizing the effect of said inherent capacity between the tube elements consisting of; a unitary device for slipping over the tube terminals, said unitary device comprising, a plurality of condensers assembled on a mounting plate, having holes for the tube terminals, each condenser provided with means for engaging the tube terminals as these are passed through the mounting plate.

9. For use with a radio vacuum tube having a plurality of elements with terminals therefor, said elements having an inherent capacity therebetween; means for assisting in neutralizing the effect of said inherent capacity between the tube elements consisting of; a quickly detachable multiple condenser unit for slipping onto the tube terminals, said unit comprising a mounting plate, having condensers assembled thereon and means connected with each condenser for engaging the tube terminals as the unit is slipped into place thereon.

10. For use with a radio vacuum tube having a plurality of elements with terminals therefor, said elements having an inherent capacity therebetween; means for assistig in neutralizing the effect of said inherent capacity between the tube elements consisting of; a quickly detachable multiple condenser unit for slipping onto the tube terminals, said unit comprising a mounting plate having condensers of different capacity assembled thereon and means connected with each condenser of the unit for connecting them to the tube terminals as the unit is slipped into place thereon in the desired relationship.

In testimony whereof, I affix my signature.

PRESTON E. GILLING.