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J. FAIGL

1,832,288

RADIO TUBE

Filed Sept. 26, 1929

Fig. 1.

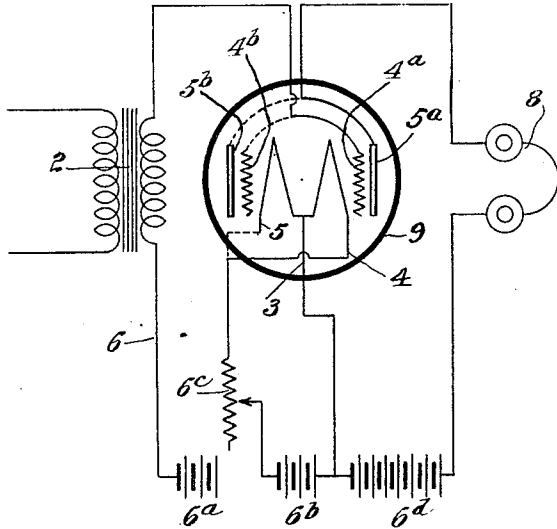


Fig. 2.

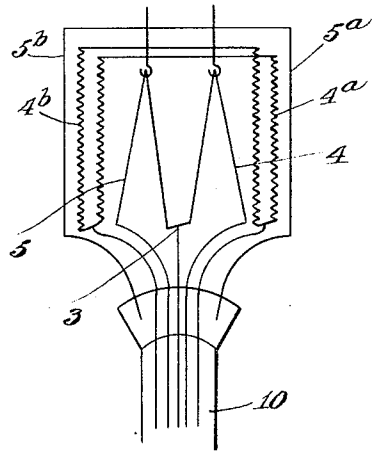


Fig. 3.

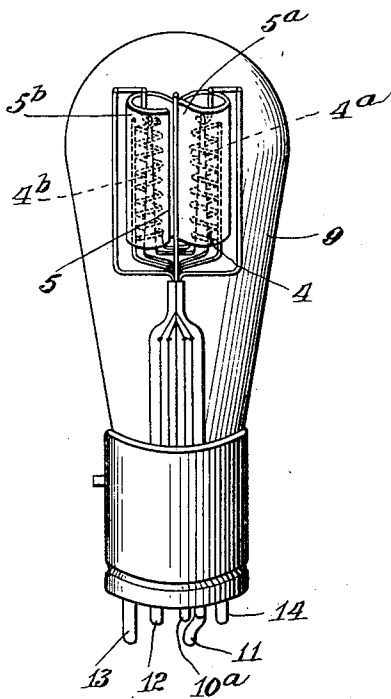


Fig. 4.

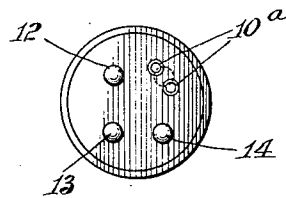
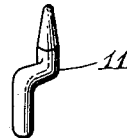


Fig. 5.



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RADIO TUBE

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This invention relates to energy translating devices and its primary object is to provide a device of such character having a large capacity or output. The device relates particularly to vacuum tube translators employing a filament or cathode, an anode or plate and an electrode or grid, the arrangement being such that when such a device is employed, for example as an amplifier, the currents to be amplified cause a variation in the potential between the filament and the grid. This in turn superposes variations of high frequency on the current flowing between the anode and the filament. By means of the invention, I increase the capacity of such devices without materially advancing the cost of manufacture and without affecting the general design or fittings or mountings employed by the general class of translating devices at the present time in connection with their installation in systems employing such devices.

I attain these objects by the combinations and arrangements of apparatus hereinafter more fully described and claimed in a manner so that those skilled in the art may understand and construct the same, it being understood that changes and variations may be made in the specific disclosures of the drawings and specification within the scope of the claim, without departing from the spirit of my invention.

In the accompanying drawings, Figure 1 is a diagrammatic view of a radio amplifying system embodying my invention; Figure 2 is another diagrammatic view showing elements of the tube; Figure 3 is a perspective view of a vacuum tube translating device embodying the invention; Figure 4 is a bottom view of the tube base; and Figure 5 is a detailed perspective view of a contact leg or switch pin employed in the base of the tube; all the views to be hereinafter more fully referred to.

In Figure 1 the numeral 2 indicates a source of current, preferably in the form of a detector; numeral 3 indicates a common negative line leading from the filaments while the numerals 4 and 5 indicate the contacts of a positive pole of the filament; the numerals 4a and 4b indicate grids or electrodes. As will be

understood, these grids and the positive poles of the filaments 4 and 5 are connected in the circuit 6, and current in that circuit causes a variation in potential between the cathode and the connected electrode. This in turn superposes variations of high frequency in the current flowing between the cathode and anode or plate 5a or 5b. Connected in the circuit 6 is battery 6a, and across the filament battery 6b and the usual rheostat control 6c, while across the negative pole of the filament and the plate or plates 5a is battery 6d, and output mechanism 8.

The two elements shown in Figure 1 are mounted in a common tube or vessel 9 as shown in Figure 3 (and also partially indicated in Figure 2 by the internal mounting stem 10 of the tube). Two positive terminals or contacts 10a are provided on the base for the two filaments. These positive terminals or contacts are preferably tubular or adapted to receive a switch pin or contact 11 shown in Figure 5. As will be seen in Figure 4 the contacts 10a are relatively offset to opposite sides of the position or location which would be the normal or usual position of a single contact or pin conforming to the symmetrical spacing of such pins or contacts on vacuum tubes now in use as indicated by the dotted circle in Figure 4 midway between the contacts 10a. The switch pin 11 is correspondingly offset intermediate its terminal portions so that when it is inserted in either one of the contacts or terminals 10a, the external portion of the pin will occupy said normal position of the dotted circle intermediate the contacts 10a. In other words, this positive terminal formed by the pin 11 thus bears the same relation with respect to the remaining contacts on the base of the tube no matter which contacts 10a receives the switch pin 11. The remaining contacts 12, 13 and 14 connect respectively to the grids 4a and 4b, the plates 5a and 5b, and to the negative side 3 of the filaments.

In the embodiment shown it will be appreciated that there are two distinct sets of filaments, plates and grids. The dotted lines in Figure 1 represent the connections for the reserve elements 4b and 5b. Should a filament

become destroyed or "burned out", the pin 11 may be withdrawn from the terminal respective to the said destroyed filament and quickly and readily placed in the other terminal 10a respective to the remaining filament. It will be seen that when the useless filament is abandoned and the reserve filament is brought into use, the latter is surrounded by the reserve grid and plate respectively, and proper spacing between the elements is by the construction assured. This is a very important feature of the invention. The destruction of one filament in no way interferes or impairs the operation of the remaining filament or grid or plate. The spacing is such as to provide for efficient operation of the translating device in the energizing of the filament and grid and delivery or impingement of the electrons emitted from the electrode. Furthermore, the presence of the two filaments or two grids or two plates in a single vacuum chamber in the arrangement shown does not impair the operation or efficiency of the tube or in any way interfere with the operation of the system using it.

While I have described my invention in connection with an embodiment thereof employing two sets of filaments, I do not desire to limit myself thereto. Furthermore, it will be apparent to those skilled in the art that changes may be made in the specific design and construction of the parts and the arrangement thereof, without departing from my invention. Thus, in the construction of the plates 6 which are shown as being in the form substantially of reverse curves or the letter S, that the free edges are slightly spaced from the opposite ends of the wall 12 interposed between the two filaments, so that each plate properly surrounds the grid in such manner that the filament is in turn properly surrounded or enclosed by each grid, still it will be apparent that the plates may be separate or independent of each other and that other changes may be made as stated, all within the scope of the claim.

Having thus described my invention what I claim and desire to secure by Letters Patent is:

A radio tube comprising a base adapted to be engaged by a socket having four regularly spaced holes therein, a vacuum chamber mounted on said base, a plurality of filaments mounted in said chamber, a plurality of grids each surrounding a filament, a plurality of plates each surrounding a grid, three prongs mounted in said base and projecting from the bottom thereof and adapted to be engaged by the terminal holes in the socket when the base is engaged by said socket, one of said prongs connecting with said plates, a second with said grids, and a third connecting with the common negative terminal of said filaments, the usual fourth prong being omitted from its symmetrical position relative to

said three prongs, a plurality of contact sleeves in said base each connected to one of the positive terminals of said filaments, said contact sleeves being positioned adjacent to and equidistantly from the position normally occupied by a fourth pin if present, and a removable contact pin for engaging any one of said contact sleeves in the base and having an offset portion for engaging the corresponding terminal hole in the socket.

In testimony whereof I affix my signature.
JULIUS FAIGL.

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