Feb. 25, 1930. C. HORTON 1,748,482

RADIO RECEPTION DEVICE

Filed June 4, 1925 3 Sheets-Sheet 1

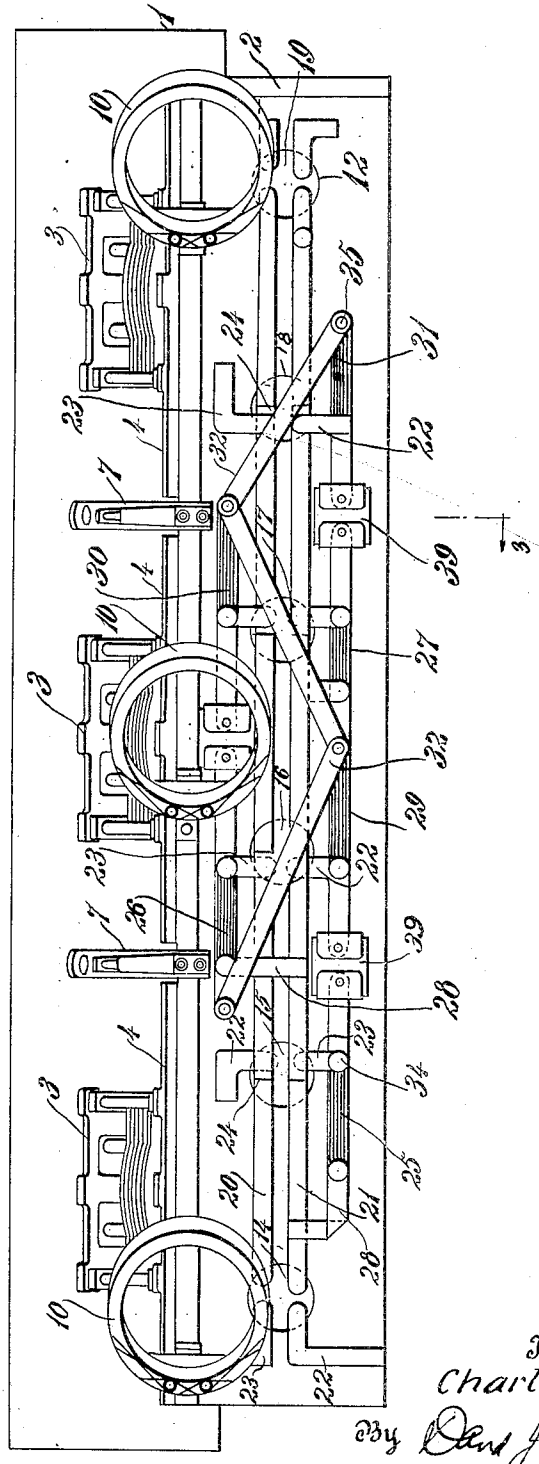


Fig. 1.

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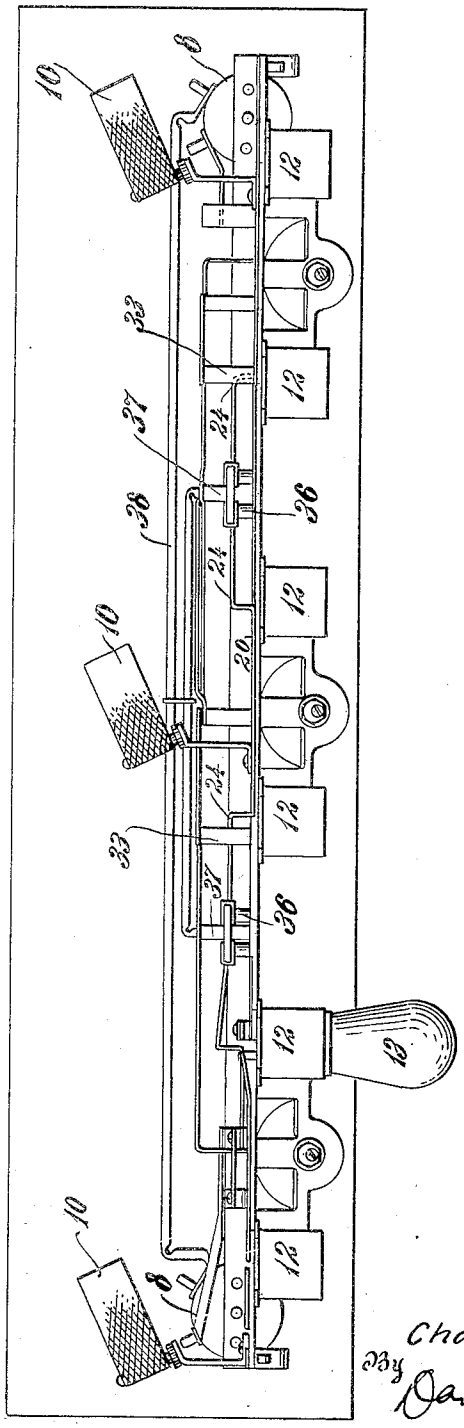


Fig. 2.

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Fig. 3.

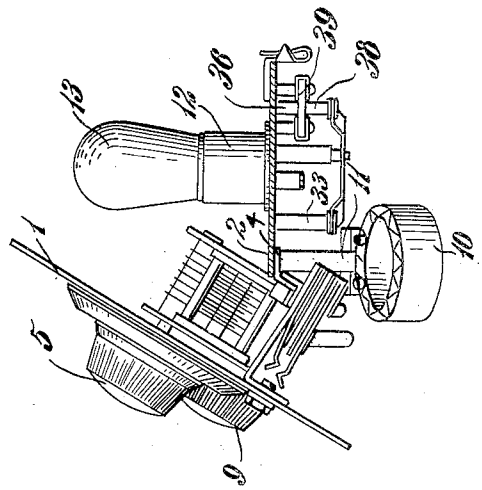
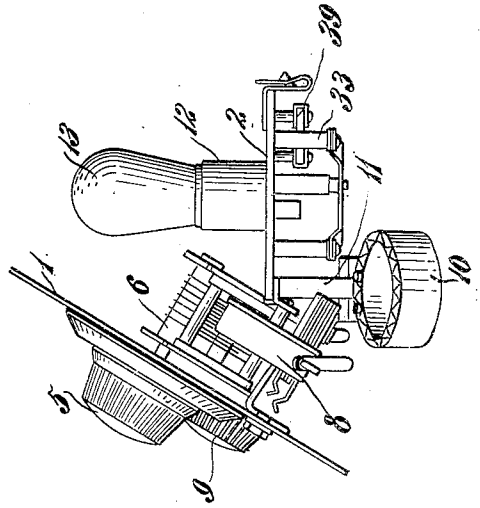


Fig. 4.



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UNITED STATES PATENT OFFICE

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RADIO RECEPTION DEVICE

Application filed June 4, 1925. Serial No. 34,769.

This invention relates in general to improvements in radio reception apparatus, being particularly directed to structural arrangement of the contact members and conductors interconnecting the various elements contained in a radio reception apparatus, and applicable in radio reception.

Up to the present time, connecting members or links between the active functioning elements of a radio reception apparatus have been metallic electro conductive members or terminals interconnected with one another, and with the functioning elements in the radio reception apparatus by means of the conductors in the forms of wires or cables. These contact members in themselves are usually soldered to the panel or to the reception functioning elements and are connected to one another by a series of conductors which are either soldered, twisted or clamped into contact with one another.

In general, the wiring diagram of a radio reception apparatus at the present time contains so many interconnected wires or cables, as to present considerable complications in the assembling of a radio apparatus and to produce considerable errors in the said assembling, at the same time being very misleading, as to the comprehension thereof, to the amateur who purchases such device.

Since radio receiving sets are now more or less standardized, that is, are produced complete in assembly plants, it has been the object of manufacturers to produce a simplified and yet more efficient wiring system in a radio set. With such view point in mind, it has been the object of the applicant to eliminate the conglomeration of the various interconnected systems of wiring and to substitute therefore a simple unitary and yet uniformly efficient system of contacts and conductors which are easily positioned on the panel of a radio outfit and at the same time carry out their respective functions without any diminution of the efficiency.

Among the objects of this invention it is contemplated to provide a bus bar system of conductors for connecting the terminals of the functioning elements adapted for radio reception; to eliminate a series of independent and interconnected conductor elements for connecting the reception elements; to provide a plurality of unitarily formed integral elements for cooperating with a series of the functioning elements; adapted for radio reception; to eliminate the use of numerous soldered joints or twisted joints between elements; to simplify the wiring arrangement of the sub-panel and to provide a more efficient radio reception device in a simpler and more effective manner and at a lower production cost.

Specifically it is aimed to provide a simple bus bar linkage between the various terminals of the vacuum tubes, or similar elements employed in a radio reception apparatus, which bus bars are continuous in length and form a unitary interconnection between successive elements.

Further it is aimed to provide a bus bar linkage between the fixed condenser elements employed in a radio reception apparatus, which condenser elements are interlinked with the fixed resistance and grid leak elements.

Still further it is aimed to provide a bus bar arrangement for the successive grid leak and resistance elements.

Further it is aimed to so construct the apparatus as to provide for proper insulation of the various bus bars to one another whereby to eliminate any short circuits.

Further it is aimed to provide a double bus bar system interconnecting the filament elements of successive vacuum tubes which bus bars are unitary in construction and which are offset in the stamping so as to be insulated and out of contact from the successive adjacent grid and plate contact bars.

Still further it is aimed to provide a readily assembled system of conductors, in conjunction with the vacuum tube supporting panel, for simplifying and making more efficient the contacts with the electro reactive elements supported thereon.

Still further it is aimed to eliminate the soldering and twisting operations in the positioning of these contact elements; it being aimed to fix the bus bar elements at points

along the panel member by eyeletting or screwing the same thereto.

These and other advantages, capabilities, and features of the invention will appear from the subjoined detailed description of one specific embodiment of the invention as illustrated in the accompanying drawings in which,

Fig. 1 is a plan view looking upward at the apparatus.

Fig. 2 is a side view of the apparatus.

Fig. 3, is a section along lines 3—3 of Fig. 1.

Fig. 4 is an end view at the left of Fig. 1.

Referring particularly to the reference characters in the drawings; numeral 1 represents a main panel member. Numeral 2 represents the sub-panel, displaced angularly of said main panel, so that the sub-panel assumes a position in the horizontal plane with respect to the base of the container in the apparatus whereby the tubes contained therein shall be vertically positioned whereby the main panel and its accessories, including the various dials, is positioned at an angle to the base of the cabinet. The sub-panel carries thereon variable condenser members 3 attached thereto by means of an angle bar 4 which angle bar is attached to and displaced angularly of the sub-panel so that the condensers will be parallel to the main panel and so that the dial 5, shown in Figs. 3 and 4, will be attachable to the shaft member 6 of the condenser. There are also attached to the sub-panel member 2, by means of the angle bar 4 a plurality of jack members 7 which have one portion thereof fixed to the main panel 1. This main panel of course rests on the side walls of the cabinet, not shown, so that the sub-panel which is attached to the jack by the angle bar will be supported indirectly through the main panel but otherwise, will be entirely independent thereof. At the end extremities of the sub-panel 2 there are positioned rheostats 8 which rheostats are attached to the angle bar and which rheostats are angularly displaced on said sub panel and which consequently are parallel to the main panel 1 and having shaft members passing through main panel which shaft member is actuated by dial members 9 on the main panel, the movement of which dial members controls the amount of resistance produced by the rheostat.

The sub-panel 2 carries therein a plurality of inductance coils 10 which coils are attached by means of angle bar 11 to the sub-panel and which inductance coils are angularly displaced from said sub-panel, and though the inductance coils 10 are herein shown as angularly displaced, they may be positioned parallel to the sub-panel, it being within the province of the inventor to vary the position of the coils. Tube sockets 12 are positioned along the length of the sub-panel 1 and consist essentially of bakelite sockets, though metal socket members may be applied in this invention.

These reception functioning elements completely form the essential main elements in the reception device with the exception of the fixed condensers and leaks which shall be described in conjunction with the particular conductors, the structural formation of which forms the subject matter of this invention. Though the elements indicated previously in the description are those used in this preferred form of the invention, it is within the province of the inventor to vary the elements used in the reception or to vary their relative position with respect to one another.

For the purpose of indicating in detail the functions and advantages of the bus bar arrangement, the various tube members 13 which are to be positioned in the socket members 12 will be numbered 14, 15, 16, 17, 18 and 19 respectively.

Referring particularly to Fig. 1; it should be noted that the connection between all the respective filament terminals of the tube members 13 which are maintained in the socket members 12, consist of single unitary bus bars 20 and 21 formed of a length of conductive material such as brass, which bars are offset where they of necessity must be adjacent the flat leads or contacts 22 and 23 cooperating with the plate, and grid members respectively in the vacuum tube 13. In this manner it is seen that the bus bars 20 and 21 will be offset as at 24 between tubes 15 and 16 so as to prevent contact with the grid and plate connecting flat bars 22 and 23 passing under the same and transversely thereof which members 22 and 23 serve to contact with the terminals of the tube, not shown. Likewise, the bus bars 20 and 21 have offset portions between tubes 17 and 18 to allow for the passage therein and transversely thereto for the plate and grid bus bar connections 22 and 23.

As seen clearly in Fig. 1, the bus bars 21 and 22 extend in a single length through and in contact with each of the tubes in the apparatus. In this manner it can be readily seen that the bus bar members of uniform length and of proper structure may be applied to form a single contact for each and every filament terminal of the vacuum tubes. In this manner the numerous individual conductors between filaments and their respective connection points are eliminated since the bus bars 21 and 22 may be readily fastened by means of riveted eyelets or screws or bolts to the subpanel 1 at a few points along their lengths.

As indicated in Fig. 1, the plate and grid connecting bars 22 and 23 which are similarly flattened members of conductive properties, may be attached at points on the sub-

panel 1 so as to properly engage the contact terminals of the vacuum tube 13.

Cooperating with the previously mentioned elements adapted for use in the reception of radio signals there are indicated grid leaks 25, 26 and 27 which have one end thereof connected with the grid members 23, and the other end thereof attached to a flattened bus bar or connecting conductor 28 leading to the filament and readily attachable thereto.

Likewise there are formed a plurality of plate resistances 29, 30 and 31 which are connected at one extremity to the flattened bar or plate lead 23 which plate lead is directed to the plate terminal in the vacuum tube, and the opposite ends of which plate resistance are connected by diagonally formed bus bar 32 which may be formed of a unitary flat strip of conductive material and bent in any manner to contact with plate resistances therefor. Though the form of this connecting plate 32 as herein connected is a Z, it is well within the province of the inventor to vary the fastening of the plate resistance in the circuit and consequently change the configuration of the connecting bus bar 32. Inasmuch as these plate resistances carry currents of high voltage, it is advisable to support the same on insulator blocks 33 shown in Fig. 2.

Between the respective grid leaks and the plate resistances, which elements are respectively connected to the plate and grid leads 22 and 23, there are positioned fixed condenser elements 39, one end 34 of each of which contacts with a grid member 23 and the other end of which contacts with the plate member 22. The extremity of the member 33 is connected at 35 to the "B" battery, not shown.

Referring to Fig. 2; it is noted that the condenser elements are supported and insulated from the panel by means of insulator blocks 36, and insulated from the plate bus bars 32 at insulator blocks 37 so that insulation of the same will be readily carried out.

The rheostat members 8 are interconnected by a similar flat bus bar member 38 so that the main connections between the functioning resistance elements is indicated as between the vacuum tube terminals, and the grid leaks, and the plate resistances will be carried on in a simple manner.

A plurality of bus bar members 20 and 21 as indicated in the drawing have been indicated as being offset rectangularly, but applicant does not wish to be limited to such a feature since it is well within the scope of the invention to stamp the bus bars in various forms and to provide various contact terminals thereon for interconnecting the remaining elements in the radio reception device which are herein not shown as interconnected. However, these connections are few in number and can readily be made by forming similar terminal posts on said bus bar to which the connected wire may be attached.

Though this system of interconnecting bus bar members has been indicated in this specific radio apparatus, it is within the scope of the invention to apply this arrangement of bus bar and interconnecting bars into any radio device.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit of the invention as set forth in the appended claims.

What is claimed is:

1. In a device of the class described the combination with the panel member containing vacuum tubes, of prong members depending from said vacuum tubes, bus-bar members extending throughout the length of the panel member, said bus-bar members being adapted to form a flexible contact with the filament prongs of successive vacuum tubes.

2. In a device of the class described, the combinaton with a panel member having a plurality of casings for supporting vacuum tubes, vacuum tubes positioned in said casings and having conducting means depending therefrom, unitary bus-bar members extending throughout the length of the panel member at the under portion thereof, said bus-bar members being adapted to form a positive flexible contact with the conducting means depending from said vacuum tubes.

3. In a device of the class described, the combination with the panel member containing vacuum tubes having prongs depending therefrom, of a bus-bar member comprising a flat strip of flexible metal extending throughout the length of the panel member below the vacuum tubes, said bus-bar member being adapted to form a positive flexible contact with the filament prongs of the successive vacuum tubes.

4. In a device of the class described, the combination with the panel board, of a plurality of vacuum tubes supported therein, conducting prongs on said vacuum tubes depending from said vacuum tubes and passing through the panel board, a flexible unitary bus-bar member attachable to the panel member and extending throughout the length thereof, said bus-bar member being adapted to form a positive pressure contact with the individual prongs depending from the respective vacuum tubes.

5. A radio receiver containing radio signal reception elements thereon, of bus-bar connections between said elements, said bus-bar consisting of flat conductor pressing upwardly to form a flexible contact with a plurality of similar elements, said bus-bar being offset to allow for the positioning of the connection means for the remaining elements.

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