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2,280,305

VOLUME CONTROL FOR HEARING AIDS

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Fig. 1.

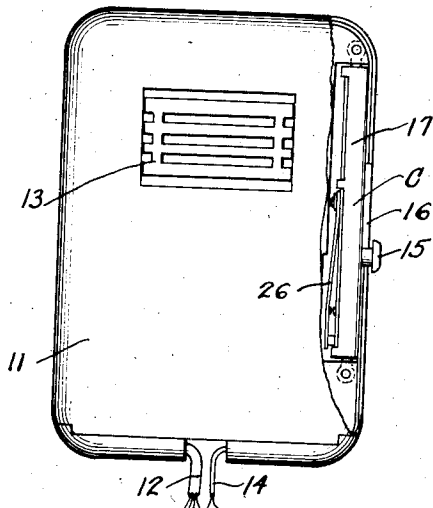


Fig. 2.

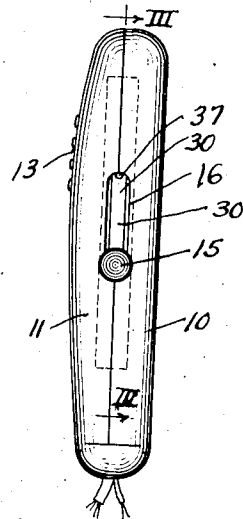


Fig. 4.

Fig. 3.

Fig. 5.

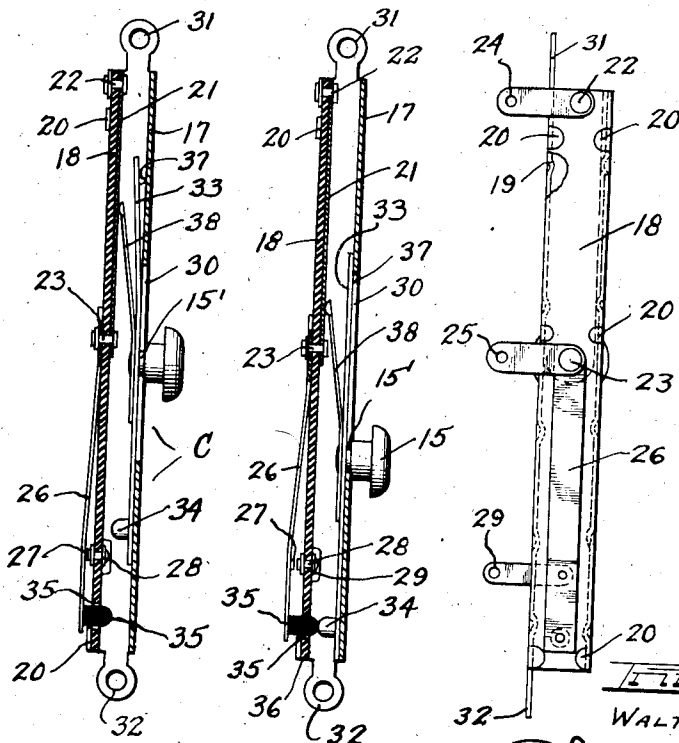
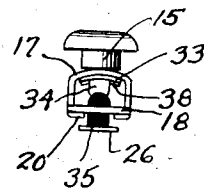


Fig. 6.



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VOLUME CONTROL FOR HEARING AIDS

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Application May 3, 1941, Serial No. 391,761

2 Claims. (Cl. 201—62)

My invention relates to a control assembly designed particularly for use in electrical hearing aids for controlling the connection of battery circuits with a microphone assembly and for controlling the amplifying circuits produced by thermionic tubes so that the user of the hearing aid outfit may readily control the sound volume from an earpiece.

An important object of the invention is to assemble the control elements compactly in a casing to form a unitary structure which can be readily inserted within the microphone casing along one edge thereof for operation by a button projecting through the edge wall.

A further object is to provide such arrangement for the control that it will normally disconnect the battery circuits for the microphone assembly and when operated the battery circuits will be first connected with the microphone assembly and further operation will effect control of the amplifying circuits for the desired sound volume from the earpiece.

The various features of my invention are incorporated in structure shown on the drawing, in which drawing—

Figure 1 is a front elevation, partly in section, of a casing for a microphone, thermionic tubes, and other elements for amplifying sound;

Figure 2 is a side elevation of the casing;

Figure 3 is an enlarged section on plane III—III, Figure 2, of the control assembly, showing the battery circuit switch open;

Figure 4 is a section like Figure 3, showing the battery circuit closed;

Figure 5 is a rear elevation of the control assembly; and

Figure 6 is an end view of the control assembly.

The microphone case shown is rectangular and comprises a body 10 and a detachable cover 11, wires 12 from A and B batteries entering the casing at the bottom and the cover being provided with a grill 13 for receiving sound to be amplified, the wires 14 leading to an earpiece (not shown).

The unitary control assembly C is designed to extend along the inside of a side wall of the body 10 of the casing for projection of its operating button 15 through a slot 16 in the casing side. The control assembly comprises an elongated housing 17 of U-shaped cross-section and preferably of comparatively light sheet metal. A strip 18 of insulating material covers the open end of the housing, edge portion 19 of the housing side walls being deflected inwardly so as to provide seating area for the insulating strip, and

at various points wings 20 extending from the side walls of the housing are deflected over against the outside of the insulating strip to hold it in place.

Against the inside of the strip 18 along the upper portion thereof is secured a resistance element 21 which may be in the form of a strip of insulating material with a coating on its outer side of resistance material, such as graphite. Upper and lower rivets 22 and 23 secure the element 21 and these rivets have terminal plates 24 and 25 extending therefrom for connection of the resistance element 21 in circuit. A switch blade 26 is secured at its upper end to the insulating strip 18 by the rivet 23 and this switch blade, near its lower end, carries a contact 27 for engagement with a terminal 28 mounted on the insulating strip 18, this terminal having a plate 29 extending therefrom for connection with a circuit.

In its outer wall the housing 17 has a longitudinally extending slot 30 for registering with the slot 16 in the microphone casing, a side wall of the housing 17 terminating in eyes 31 and 32 by which the housing may be secured in service position along the inner side of the side wall of the casing, as shown on Figure 1.

The control button 15 has a reduced end 15' extending through the slot 30 and is secured to a spring bar 33 engaging against the inner side of the front wall of the housing 17. At its lower end the spring bar carries an abutment 34, and extending from the lower end of the switch blade 26 is a stud 35 of insulating material, this stud being projectible through a passageway 36 in the insulating strip 18. When the button 15 is shifted downwardly to the end of the slot 30, the abutment 34 will be opposite the passageway 36 and will engage the stud 35 to hold it outwardly for flexure of the switch blade 26 to disengage its contact 27 from the terminal 28. Upon a slight upward shift of the button 15 the abutment 34 will be withdrawn from the stud and the switch spring will be free to engage its contact with the terminal 28.

At its upper end the spring strip 33 has a portion deflected to form a projection 37 extending into the slot 30 below the edge at the upper end of the slot, so that it will tend to hold the spring strip 33 in its lower or normal position for holding the switch blade 26 in open position. Upon upward movement of the button 15 the projection 37 is readily cammed out of the slot 30 and is then engaged against the rear side of the front wall of the housing 17 to flex the strip

33 which then exerts spring action against the button to hold it in frictional engagement with the front wall of the housing 17 to thus hold the button in its adjusted or set position.

A contact spring 38 is also secured to the inner end of the button 15, with its lower end against the spring strip 33, the outer end of the spring engaging against the inner side of the resistance strip 21. When the button is in its lower position, shown on Figure 3, the end of the contact spring 38 will be in engagement with the lower end of the resistance element and as the button is shifted upwardly the end of the contact spring travels along the resistance surface of the resistance element.

The terminal plates 24, 25 and 29 extending from the terminals 22, 23 and 28 of the terminal strip 18 are insulated by this strip from the metallic housing 17, but the outer end of the contact spring 38 is in electrical connection with the housing.

On the drawing I have not shown within the microphone casing the various elements and their connections with the control structure C, as my invention is concerned particularly with the mechanical construction and arrangement of this control assembly and its location within the casing. The long slender housing 17 with the control parts compactly arranged therein will take up little space along the inside of the side wall of the casing body 10, and then, by operation of the button 15, the switch blade 23 may be controlled to connect or disconnect the battery supply from the microphone assembly and the cooperation of the contact spring 38 with the resistance element 21 will proportion and control the current flows for the desired sound volume at the ear-piece.

I have shown a practical and efficient embodiment of my invention, but I do not desire to be limited to the exact construction and arrangement shown and described, since changes and modifications may be made without departing from the scope of my invention.

I claim as follows:

1. A control assembly for the purpose described, comprising an elongated slender frame of U cross section, a terminal strip of insulating material forming a closure for the open side of said frame, a resistance strip within said frame on the inner side of said terminal strip to extend along the upper portion thereof, upper and lower securing means for securing said resistance strip to said terminal strip and serving as circuit terminals for said resistance strip, a switch spring at the back of said terminal strip secured at its upper end to said terminal strip by the lower securing means for said resistance strip, said terminal strip at its lower end having an opening therethrough, a stud on the lower end of said switch spring extending through said opening, a terminal contact on said terminal strip above said opening normally contacted by said switch spring, a slider element in the form of a spring bar engageable against the inner side of the front wall of said

frame, the front wall of said frame having a longitudinally extending slot therethrough, a button movable along the outer side of said front wall and having a part extending through said slot and secured to said slider member whereby said slider member may be shifted by said button upwardly and downwardly in said frame, a contact arm extending from said slider member for engagement at its end with said resistance strip as said slider member is moved up and down, an abutment on the lower end of said slider member engageable with the stud on said switch spring to effect disconnection of said switch spring from said terminal contact when said slider member is moved to its lower position and said contact arm is at the lower end of said resistance strip, whereby said switch spring will then be held in circuit opening position.

2. A control assembly for the purpose described, comprising an elongated slender frame of U cross section, a terminal strip of insulating material forming a closure for the open side of said frame, a resistance strip within said frame on the inner side of said terminal strip to extend along the upper portion thereof, upper and lower securing means for securing said resistance strip to said terminal strip and serving as circuit terminals for said resistance strip, a switch spring at the back of said terminal strip secured at its upper end to said terminal strip by the lower securing means for said resistance strip, said terminal strip at its lower end having an opening therethrough, a stud on the lower end of said switch spring extending through said opening, a terminal contact on said terminal strip above said opening normally contacted by said switch spring, a slider element in the form of a spring bar engageable against the inner side of the front wall of said frame, the front wall of said frame having a longitudinally extending slot therethrough, a button movable along the outer side of said front wall and having a part extending through said slot and secured to said slider member whereby said slider member may be shifted by said button upwardly and downwardly in said frame, a contact arm extending from said slider member for engagement at its end with said resistance strip as said slider member is moved up and down, an abutment on the lower end of said slider member engageable with the stud on said switch spring to effect disconnection of said switch spring from said terminal contact when said slider member is moved to its lower position and said contact arm is at the lower end of said resistance strip whereby said switch spring will then be held in circuit opening position, a projection on the upper end of said slider member extended by said slider member through the upper end of said slot for friction engagement with the slot upper edge to releasably hold said slider element in its lower position and frictionally engageable with the inner side of the front wall of said frame for releasably holding said slider member in any of its intermediate positions.

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