Feb. 28, 1928.

1,660,979

W. J. THAYER

CURRENT CONTROL DEVICE

Filed June 30. 1926

Fig. 1.

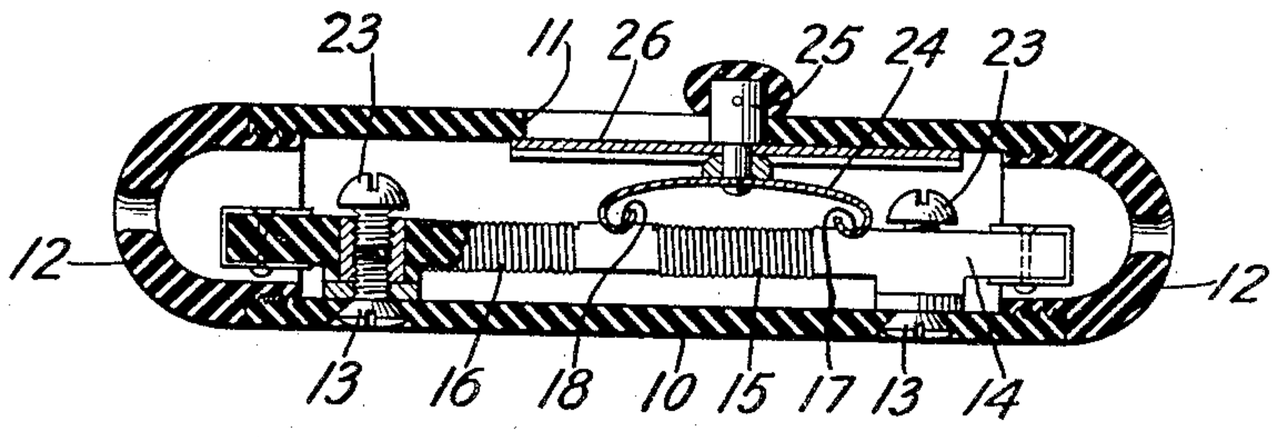


Fig. 2.

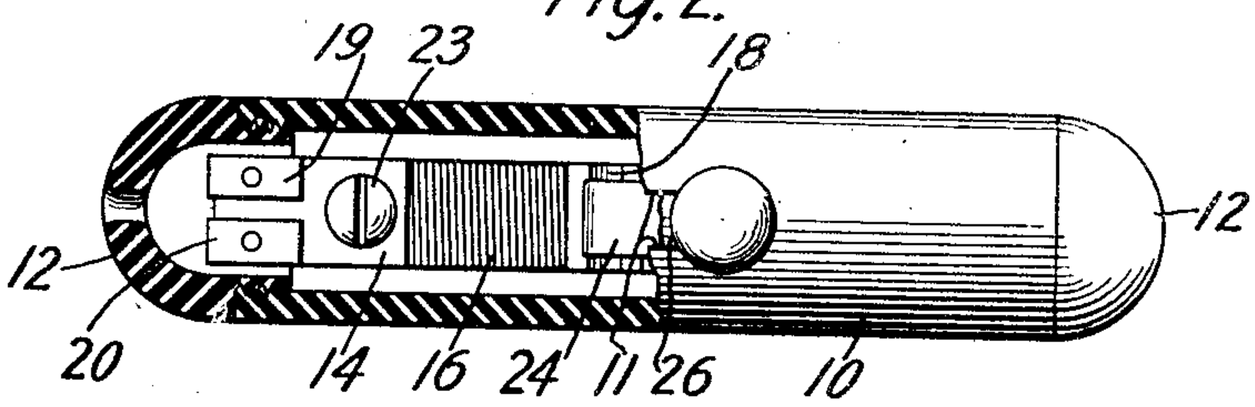


Fig. 5.

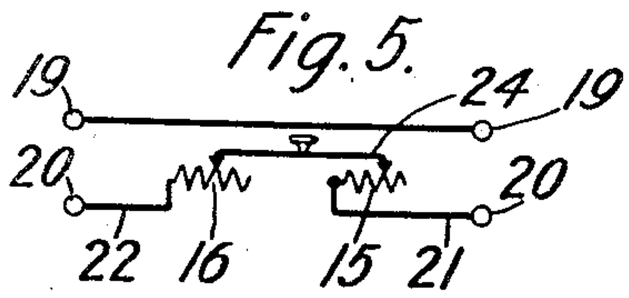


Fig. 4.

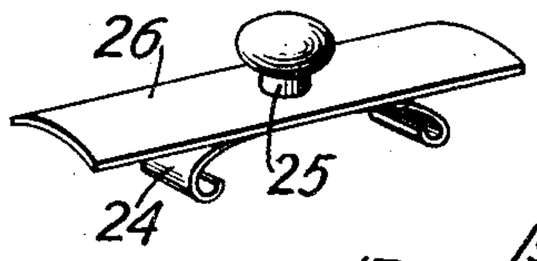
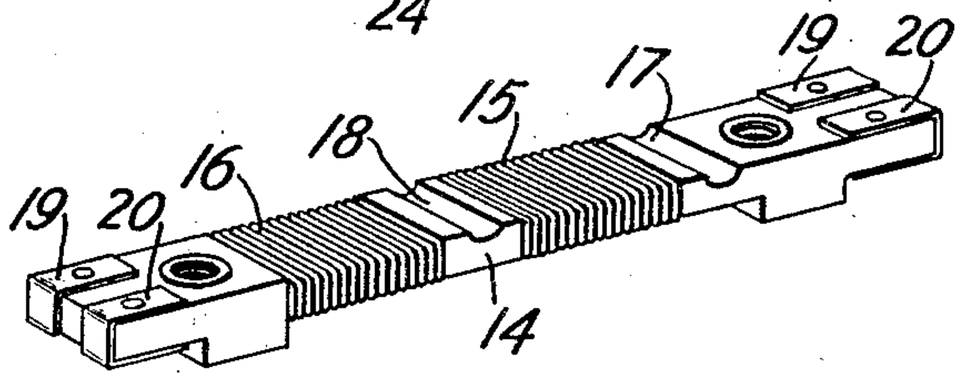


Fig. 3.



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UNITED STATES PATENT OFFICE.

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CURRENT-CONTROL DEVICE.

Application filed June 30, 1926. Serial No. 119,621.

This invention relates to improvements in current controlling devices and more particularly to means for controlling currents of small value of the order of those present in deaf sets etc.

The principal object of the invention is to permit the control of currents of small value with but slight movement of the controlling element.

A more specific object of the invention is to enable the user of a deaf set to vary the volume of its output to best suit his or her requirements.

A further object of the invention is to permit the volume control device to be housed within a very limited space and yet allow sufficient surface of the resistance elements to be exposed to obviate undue heating.

One feature of the invention is a plurality of longitudinally aligned resistance elements, supported upon a single strip of insulating material, and bridged by a single adjustable contact in such a manner that relatively small movement of the contact cuts in or out a proportionately large amount of resistance.

Another feature of the invention is a means for excluding dust and other foreign substances from the interior of the device whereby interference with its proper operation is avoided.

A further feature of the invention is a balanced resilient contact element which yieldably retains the dust excluding means in position against the wall of the enclosure, as well as serving to complete the electrical circuit.

In accordance with this invention there is provided a structure of extreme simplicity and small size which facilitates production and permits of a relatively wide range of control in an unusually limited space, and makes it useful with deaf sets such as the audiphone.

Such a structure, that is, one in which two or more resistance elements are simultaneously brought into action, permits the use of larger resistance wire than would be possible with a single resistance element and a movement of the contacting element no greater than that of the contacting element of this invention. The use of such resistance elements permits a wattage dissipation greater than that in a structure using only a single resistance element, since there is more surface exposed for heat radiation.

The use of a balanced contact element provides equal contact pressure on the resistance elements, thereby insuring equal contact resistances and at the same time prevents binding of the dust excluding means with the wall of the enclosure.

In the drawing, Fig. 1 is a longitudinal sectional view of a current controlling device constructed in accordance with this invention, Fig. 2 is a plan view of the device, a portion thereof being shown in section. Fig. 3 is a perspective view of the resistance elements and the mounting therefor, Fig. 4 is a perspective view of the bridging contact and the movable cover plate, and Fig. 5 is a diagrammatic view of the connections for the resistance elements.

Referring to the drawings in detail, the body 10 comprises a tubular shell of non-conducting material provided at opposite ends with internal screw threads. Formed intermediate the ends of the body is a longitudinal slot 11 for the reception of the control handle of the device. Threaded into opposite ends of the body are caps 12 which are pierced for the introduction of conductor cords.

Secured within the body 10 by attaching means such as screws 13 is an insulating strip 14 which supports intermediate its ends, spaced resistance elements 15 and 16 as will be clearly seen upon reference to Fig. 3 of the drawing. Formed in the inner face of the insulating strip 14 at the outer end of the resistance 15 is a recess 17 and a similar recess 18 is formed in the strip between the resistances 15 and 16. Secured to each end of the strip 14 is a pair of contact elements 19 and 20. The contact elements 19 are connected directly to each other, while one of the contact elements 20 is connected through the medium of a conductor 21 to the inner end of the resistance 15. The outer end of the resistance 16 is connected by a conductor 22 to the contact element 20 at the opposite end of the strip 14. In order to relieve the terminals of the conductor cords from strain, suitable securing devices such as screws 23 are provided to which the customary stay cords are attached.

In order to establish electrical communication between the resistances a bowed

spring bridging contact 24 is provided and its ends are turned back upon themselves as clearly illustrated in the drawing so as to freely ride upon the inner face of the insulating strip 14 and over the resistance elements 15 and 16. Secured to the bight portion of the spring 24 is a stud 25 which projects through a central opening formed in the slide 26. This slide lies against the inner wall of the body 10 adjacent the slot 11 and is of such a length that regardless of its position, no part of the slot is opened. It will thus be seen that the resiliency of the bowed spring 24, not only acts to retain its terminals in contact with the resistance elements, but also maintains the slide 26 in frictional engagement with the body 10 so as to effectively exclude foreign substances from the interior of the device.

The structure above described is particularly adapted for enclosure in a small housing as it gives a wide range of control with a limited movement. By thus reducing the length of movement of the control handle the slot in the housing may be made short, thereby limiting the size of the slide required to cover the slot.

In operation, it will be obvious that as the stud 25 is moved longitudinally through the slot 11 the spring 24 will be moved over the faces of the resistance elements 15 and 16, thereby varying the resistance in the circuit and thus controlling the volume of the output of the deaf set to meet the individual requirements of the user. The balanced spring 24 held in position as shown causes equal pressure on each resistance element and hence equal contact resistances. When in off position the ends of the spring 24 rest in the recesses 17 and 18 and danger of accidental movement and consequent closing of the circuit is thereby overcome.

What is claimed is:

1. A current control device comprising a body having a slot therein, longitudinally aligned resistance elements within said body, means for bridging said resistance elements, means projecting through the slot for moving said bridging means, and means movable with the bridging means to close the slot thereby excluding dust from the interior of the body.

2. A current control device comprising a body having a slot therein, resistance elements within said body, yieldable means bridging said resistance elements, means projecting through the slot for controlling the bridging means, and means movable with and held against the body by the yieldable bridging means to prevent dust from entering the body through the slot.

3. A current control device comprising a tubular body having a longitudinal slot therein, caps closing the ends of the body, an insulating strip within said body, longitudinally aligned resistance elements on said strip, a bowed contact spring for bridging said resistance elements, a stud on said spring projecting through the slot for controlling the movements of the spring, and a slide within the body for closing the slot, said slide being held against the inside of the body by the spring.

4. A current control device comprising a hollow body having a slot therein, resistance elements in said body, a bowed contact spring bridging said resistance elements, a slide supported on the bight portion of the spring for closing said slot, and means on the spring projecting through the slot to control the movements of the spring.

In witness whereof, I hereunto subscribe my name this 25th day of June, A. D. 1926.

WALTER J. THAYER.