

March 23, 1948.

E. DOUCETTE

2,438,431

ATTENUATOR

Filed April 25, 1945

2 Sheets-Sheet 1

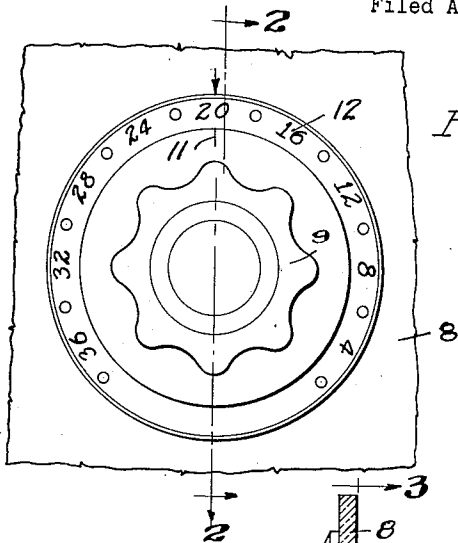


Fig. 1.

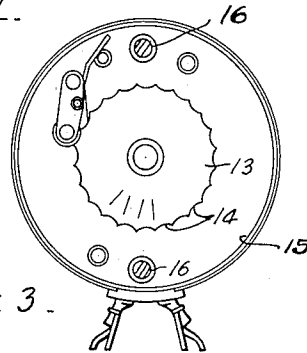


Fig. 3.

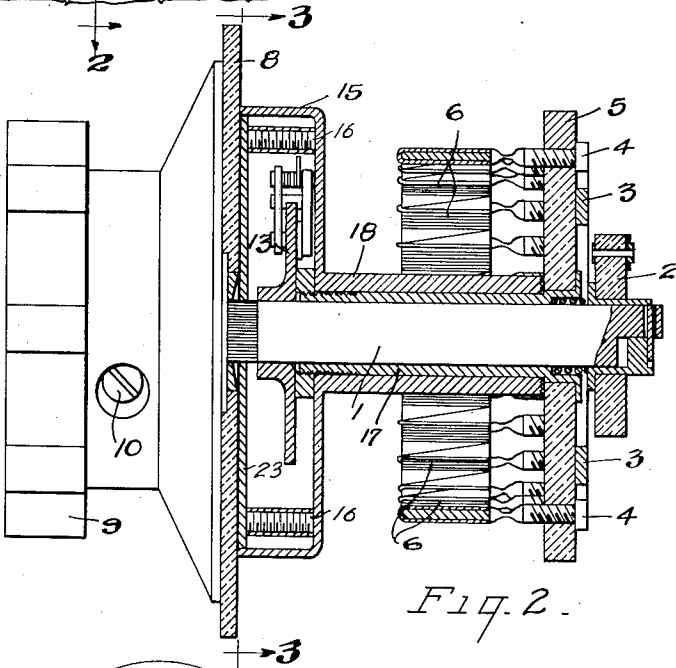


Fig. 2.

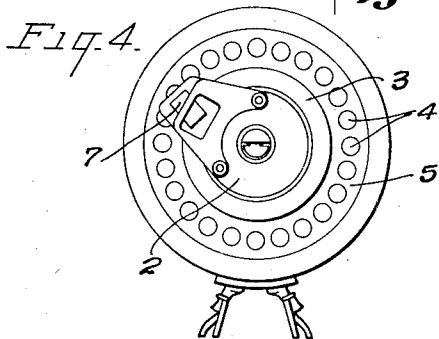


Fig. 4.

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Fig. 5.

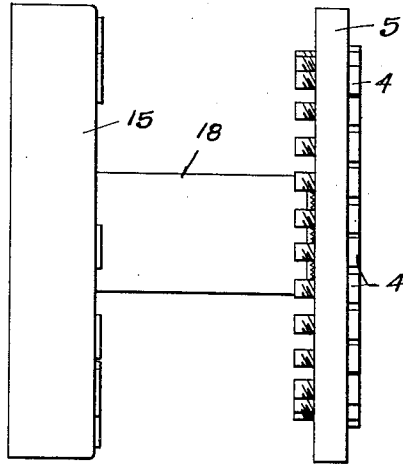


Fig. 6.

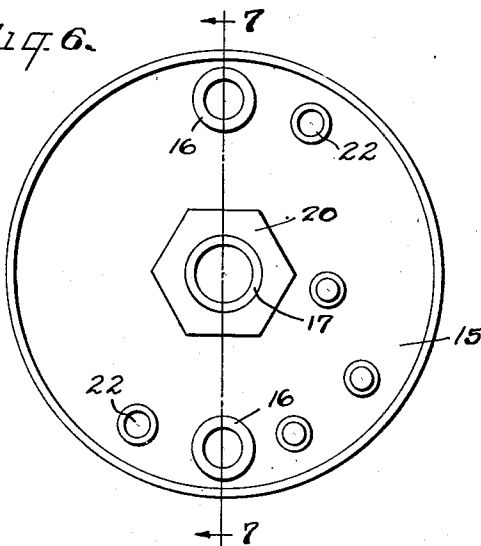


Fig. 7.

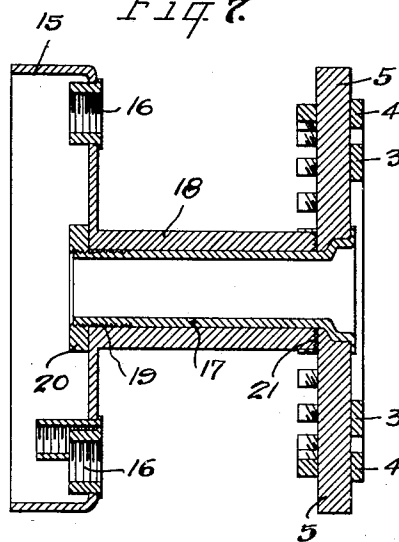


Fig. 8.

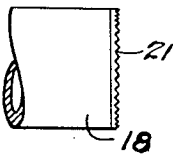
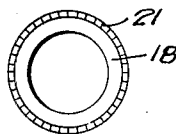


Fig. 9.



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2,438,431

ATTENUATOR

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Application April 25, 1945, Serial No. 590,265

14 Claims. (Cl. 261—55)

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This invention relates to attenuators or similar devices employed in the communications field, and an object of the present invention is to provide an improved construction of electrical instruments such as attenuator or the like which embodies novel features of construction, resulting in a reduction of manufacturing costs of the device, a simplification of its construction, and provides easy assembly and dismantling with consequent ease of repair or replacement of parts.

Another object of the present invention is to provide a novel construction of attenuators or like instrument by means of which the contact-carrying head may be accurately and easily locked in the proper cooperative position relative to the scale markings on the panel board of the instrument in which the device is employed.

With these and other objects in view, as may appear from the accompanying specification, the invention consists of various features of construction and combination of parts, which will be first described in connection with the accompanying drawings, showing an attenuator of a preferred form embodying the invention, and the features forming the invention will be specifically pointed out in the claims.

In the drawings:

Figure 1 is an end elevation of the improved attenuator looking at the panel board end of the same.

Figure 2 is a longitudinal section through the attenuator or electrical instrument taken on the line 2—2 of Figure 1.

Figure 3 is a section through the attenuator taken on the line 3—3 of Figure 2 showing the detent gear mechanism.

Figure 4 is an end view of the instrument looking at the inner or contact end of the same.

Figure 5 is a detail side elevation of a part of the instrument assembly.

Figure 6 is an end view of the assembly shown in Figure 5.

Figure 7 is a section taken on the line 7—7 of Figure 6.

Figure 8 is an enlarged fragmentary side elevation of the gripping sleeve employed in the instrument structure.

Figure 9 is an end view of the gripping sleeve.

Referring more particularly to the drawings, the improved electrical instrument or attenuator used in a set employed in the communications field includes a switch operating shaft 1 on the inner end of which is mounted a switch 2. The switch 2 may be of any suitable type and is shown

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in detail in my companion application Serial No. 590,267, filed April 25, 1945, issued March 4, 1947, as Patent No. 2,430,215. The switch structure 2 co-operates with the stationary contact ring 3 and the plurality of spaced contacts 4 which are carried by the contact carrying head 5.

The contacts 4 and the contact ring 3 are connected to resistance coils shown at 6, and when the contact member 7 of the switch 2 bridges the ring and any one of the spaced contacts 4, the electrical circuit is closed through the resistance coil connected to the respective engaged contact.

The shaft 1 projects through the instrument panel 8 and has a dialing knob 9 detachably mounted thereon in any suitable manner such as by the set screw 10. The dialing knob 9 has an indicating mark 11 thereon which co-operates with the scale or graduations 12 on the dial 8 mounted on the panel board for indicating the setting of the switch, and, consequently, the setting of the instrument.

A detent gear 13 is carried by the shaft 1 and has detents 14 in its perimeter to provide the proper detent action of the device. This detent gear 13 is rotated by rotation of the shaft 1, and its free rotation is impeded by the spring tensioned pawl to permit proper and accurate setting of the switch 2.

The detent gear 13 is enclosed in a dished housing 15 which carries internally screw threaded sleeves or posts 16 and 22. The internally screw threaded bodies 16 threadably receive suitable screws for connecting the attenuator or other instrument to the panel 8, while the threaded posts 22 receive suitable screws for attaching a cover plate 23 to the dished housing.

The shaft 1 has a sleeve 17 mounted thereabout, and the shaft is rotatable in this sleeve 17 which is rigidly connected to the contact-carrying head 5 in any suitable manner.

A second sleeve 18 is carried by the dished housing 15 and it is rotatably mounted about the sleeve 17, or rather it is mounted upon the sleeve 17 in such manner that the sleeve 17 may be rotated within the sleeve 18 when the latter is attached by means of the dished housing 15 to the panel 8; however, rotary movement of the two sleeves relative to each other is provided only during the assembly of the parts of the instrument. At such time, that is, during the assembly of the instrument, the sleeve 17 is inserted through the sleeve 18 until the externally screw threaded end of the sleeve 17 projects through the forward end of the sleeve 18 and dished enclosure 15. A nut 20 is then threaded upon a

screw threaded end of the sleeve 17 and by tightening the nut against the housing 15 the serrated or toothed end 21 of the sleeve 18 will be forced into the material of which the contact-carrying head 5 is formed to cause the sleeve 18 to firmly grip the contact head 5 and hold the contact-carrying head 5 in fixed position relative to the housing 15, and, consequently, in fixed position relative to the graduations 12 on the panel board 8, since the position of the housing 15 relative to the graduations 12 is fixed by means of the connecting bodies 16.

By the provision of the toothed end 21 of the sleeve 18, the contact-carrying head 5 may be firmly gripped and held in rigid connection with the housing 15 to hold it in proper adjusted position so that the contacts 4 will be in the proper co-operative relationship with the graduations 12.

It will be understood that the invention is not to be limited to the specific construction or arrangement of parts shown, but that they may be widely modified within the invention defined by the claims.

What is claimed is:

1. In an electrical instrument, a panel having graduations thereon, a stationary contact-carrying head, contacts carried thereby, a switch for movement over and engagement with said contacts, means for connecting said contact-carrying head to said panel including a sleeve connected to said head, a second sleeve depending from the panel having one end engaging said contact-carrying head, said second sleeve having gripping members on its end which engages said contact-carrying head, and means for forcing said gripping members into gripping engagement with the contact-carrying head to prevent accidental disconnection or relative movement of the contact-carrying head and said connecting means.

2. In an electrical instrument, a panel having graduations thereon, a stationary contact-carrying head, contacts carried thereby, a switch for movement over and engagement with said contacts, means for connecting said contact-carrying head to said panel including a sleeve connected to said head, a second sleeve depending from the panel mounted upon said first sleeve for movement relative to the first sleeve and having one of its ends engaging said contact-carrying head whereby said contact-carrying head may be positioned relative to said panel to coordinate the contacts carried by the head with the graduations on the panel, said second sleeve having one end engaging said contact-carrying head, and gripping members on said sleeve for gripping engagement with said contact-carrying head.

3. In an electrical instrument, a panel having graduations thereon, a stationary contact-carrying head, contacts carried thereby, a switch for movement over and engagement with said contacts, means for connecting said contact-carrying head to said panel including a sleeve connected to said head, a second sleeve depending from the panel mounted upon said first sleeve for movement relative to the first sleeve and having one of its ends engaging said contact-carrying head whereby said contact-carrying head may be positioned relative to said panel to coordinate the contacts carried by the head with the graduations on the panel, said second sleeve having one end engaging said contact-carrying head, gripping members on said sleeve for gripping engagement with said contact-carrying head, and means for forcing said gripping members into gripping engagement with said contact-carrying head to prevent acci-

dental disconnection or relative movement of the head and panel.

4. In an electrical instrument, a panel, a contact-carrying head, a sleeve attached to said contact carrying head, a member rigidly attached to said panel, a stem carried by said member and mounted upon said attached sleeve for movement relative thereto, said stem having gripping means formed thereon for gripping engagement with the contact-carrying head to hold the contact-carrying head in fixed position relative to the panel.

5. In an electrical instrument, a panel, a contact-carrying head, a sleeve attached to said contact-carrying head, a member rigidly attached to said panel, a stem carried by said member and mounted upon said attached sleeve for movement relative thereto, said stem having a plurality of gripping teeth formed upon one end thereof for biting engagement into said contact-carrying head to hold the contact-carrying head in fixed position relative to said panel.

6. In an electrical instrument, a panel, a contact-carrying head, a sleeve attached to said contact-carrying head, a member rigidly attached to said panel, a stem carried by said member and mounted upon said attached sleeve for movement relative thereto, said stem having a plurality of gripping teeth formed upon one end thereof for biting engagement into said contact-carrying head to hold the contact-carrying head in fixed position relative to said panel, and means co-operating with said attached sleeve for forcing said teeth into gripping engagement with said contact head.

7. In an electrical instrument, a panel, a contact-carrying head, a sleeve attached to said contact-carrying head, a member rigidly attached to said panel, a stem carried by said member and mounted upon said attached sleeve for movement relative thereto, said stem having a plurality of gripping teeth formed upon one end thereof for biting engagement into said contact-carrying head to hold the contact-carrying head in fixed position relative to said panel, said attached sleeve having threads on one end thereof, and a nut threaded on the threaded end of the attached sleeve for forcing said gripping teeth into biting gripping engagement with said contact-carrying head.

8. In an electrical instrument, a contact head having a plurality of contacts, a panel having indicia thereon which are related to the contacts, said panel and head being arranged substantially parallel to each other, a hollow connecting member, a second connecting member movably mounted in the hollow member, one of the members being rigidly fixed to the panel, said one member having teeth at the end remote from the panel which are engageable with the head, the other of said members being connected to the head so as to be capable of applying forces thereto in the direction of the panel, and means connected to the members for slidably moving them relative to each other so as to force the teeth into the head.

9. In an electrical instrument, a circular graduated dial, a hollow stem coaxially and rigidly fixed to the dial and having teeth on its extremity remote from the dial, a sleeve movably mounted in the stem, means engaging the sleeve and the stem for axially moving the sleeve, a contact carrying head mounted on the sleeve so as to be parallel to the dial and be engageable with the stem teeth, and means connecting the head to

the sleeve for axial movement therewith into engagement with the stem teeth.

10. In an electrical instrument, a circular graduated dial, a hollow stem coaxially and rigidly fixed to the dial and having teeth on its extremity remote from the dial, a contact carrying head arranged parallel to the dial and engaging the toothed extremity of the stem, a sleeve movably mounted in the stem, said head being attached to the sleeve so as to be rotatable relative to the sleeve but axially movable therewith at least in the direction of movement toward the dial, and means engaging the stem and the sleeve for providing relative axial movement therebetween so as to force the stem teeth into the head and thus fix the position of the head relative to the dial graduations.

11. In an electrical instrument, a panel having graduations thereon, a member attached to said panel and fixed against movement relative to the panel and having a fixed stem, a contact carrying head having a sleeve attached thereto, said sleeve fitting inside said stem and having a threaded end extending into said member, said stem having a toothed end engaging said head, and a nut engaging the threaded end of the sleeve and the member to force the toothed end of the stem into the head whereby the head will be fixedly related to said member and therefore to the graduations on said panel.

12. In an electrical instrument, a graduated panel, a stem rigidly connected to the panel having teeth at the remote end thereof, a sleeve movably mounted in the stem, means connected to the stem and sleeve for axially moving the sleeve, a contact head mounted on the sleeve and engageable with the stem teeth, and means connecting the head to the sleeve whereby the actuation of the aforementioned means will move the panel and head toward each other to bring

the stem teeth into engagement with the panel.

13. In an electrical instrument, a panel member having indicia thereon, a head member having a plurality of contacts, said members being substantially parallel to and spaced from each other, a hollow connecting part, a second connecting part movably mounted in the hollow part, one of the parts being rigidly fixed to one of the members, said one part having tooth means at the unfixed end thereof engaging said other member, the other of said parts being attached to a first one of members so as to be capable of moving it toward the second one of the members, and means connected to said other part and to the second one of the members for slidably moving the parts relative to each other to decrease the space between the members and thus force the tooth means into biting engagement with said other member.

14. In an electrical instrument, a panel member having indicia thereon, a head member having a plurality of contacts, a first connecting part rigidly fixed to one of said members, said part having tooth means at one end for non-rotatable connection with the other of said members, and means for forcing and holding the part in non-rotatable connection with the other member.

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