March 29, 1955 E. A. DE BELL 2,705,273

POTENTIOMETERS OR VARIABLE RESISTOR ELEMENT

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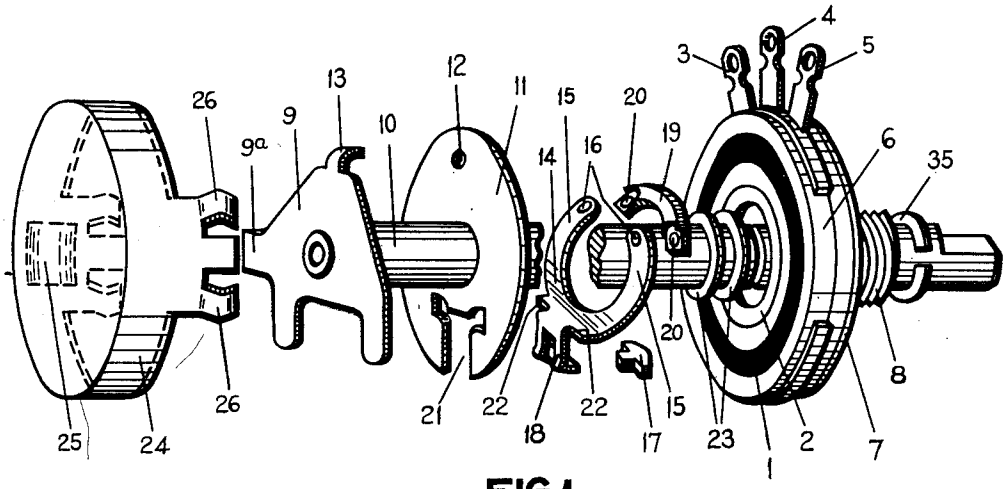


FIG.1.

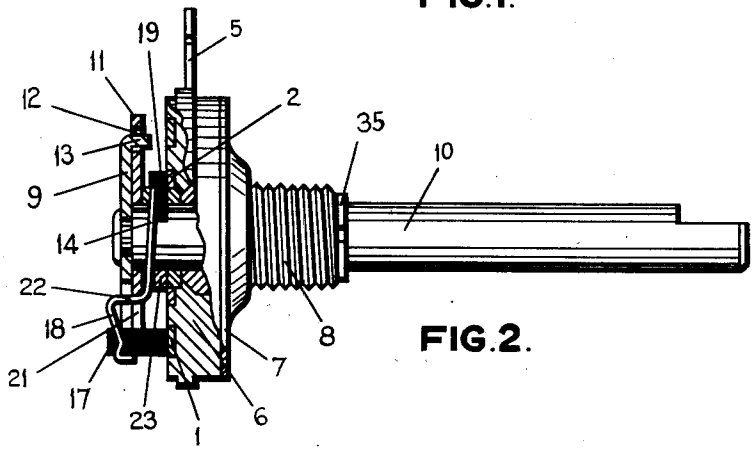
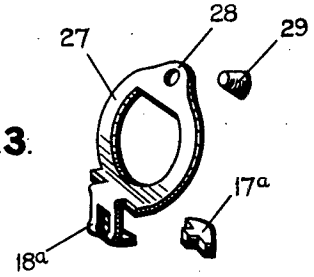


FIG.2.

FIG.3.



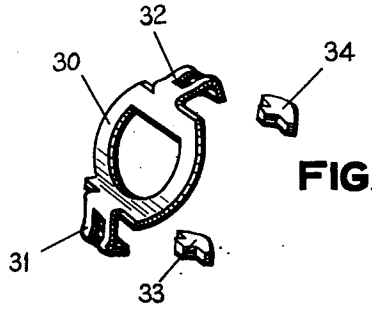


FIG.4.

Inventor
Ernest Alfred De Bell
By:- William E. P. Bayly
Attorney.

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POTENTIOMETERS OR VARIABLE RESISTOR ELEMENT

Ernest Alfred De Bell, Wroughton, England, assignor to The Plessey Company Limited, Ilford, England, a British company

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3 Claims. (Cl. 201—55)

This invention relates to potentiometers or resistor elements used in communication circuits as variable resistors, such as volume controls and time controls.

In resistance elements of the kind referred to it is customary to have a metal collector ring arranged in an insulated base, and a spring contact member is provided with metal contact button rollers or the like which make a sliding contact with the collector ring. It has been found that due to the metal to metal contact, there is an increased resistance which results in creating a noise in the communication circuit. It is an object of this invention to eliminate this defective contact resistance thereby providing a resistive device having advantageous characteristics.

An object of the invention is to eliminate or reduce to an absolute minimum any defective contact resistance thereby providing a resistive device having advantageous characteristics.

Another object of the invention is to provide the metal collector ring with a carbon brush or brushes which make a sliding contact with the metal collector ring whereby contact resistance and noise resulting therefrom is reduced to a minimum.

A further object of the invention is to fit the metal collector ring with a carbon contact in the form of a segment, stud, button roller or the like.

The invention will now be described with reference to the accompanying drawing, in which:

Fig. 1 is an exploded view of a potentiometer showing one form of carbon brush,

Fig. 2 is an elevation partly in section of a complete assembly of a potentiometer according to Fig. 1.

Fig. 3 is a detail showing another form of brush and,

Fig. 4 is a detail showing a further modified form of carbon brush.

Referring to Figs. 1 and 2:

A resistor track **1**, collector ring **2** and terminal tags **3**, **4**, **5** are embedded in a moulded insulating base **6**. The terminal tags **3** and **5** are connected to the respective ends of the resistor track **1** and the terminal tag **4** is connected to the ring **2**.

A metal backing plate **7** and an externally threaded bush **8** are moulded to the base **6** on the opposite face to the resistor track **1** and collector ring **2**.

A metal plate **9** with a projection **9a** is riveted to the end of a shaft **10** and an insulating disc **11** mounted on the shaft **10** has a slot **12** to receive a bent projection **13** integral with the plate **9** whereby the disc can rotate with the shaft **10**.

A brush holder **14** has collector prongs **15** with a dimple **16** at each end, and a contact element **17** is supported in a bent projection portion **18** formed in the brush holder **14**. A segmental non-metallic brush **19** with dimple recesses **20** for receiving the dimple ended prongs **15**, is pressed against the collector ring **2** as hereinafter set forth.

In assembling, the shaft **10** is inserted through the bush **8**, the brush holder **14** is fitted with a contact element **17** and the bent projection portion **18** is placed against

the insulating disc **11** in such a manner that the bent projection portion **18** passes into a coinciding slot **21** and the shoulders **22** formed in the brush holder **14** serve as hinges to permit the collector prongs **15** to be at an incline with respect to the disc **11**, when the shaft **10** is rotatably secured to the bush **8** by means of a C-clip **35**.

The carbon brush **19** is held in sliding contact with the collector ring **2** by means of the dimples **16** engaging the dimple recesses **20** prior to securing of the shaft **10** to the base **6**. In this arrangement the brush holder **14** being hingedly mounted in the insulating disc **11** and suitably spaced from the moulded base **6** by spacing washers **23** enables the prongs **15** to press the brush **19** against the collector ring **2**, and the contact element **17** against the resistor trace **1** as shown in Fig. 2.

A cover **24** having an indent **25** fits over the resistor assembly and is secured thereto by bending lugs **26** over the backing plate **7**. Limitation of rotation of the shaft **10** in either direction is by the projection **9a** in plate **9** abutting against the indent **25**.

Referring to Fig. 3, an alternative form of brush and brush holder is provided in which the brush holder is in the form of a ring **27** with a perforated ear **28** to receive a tapered carbon slug **29**. Said ring **27** has a bent projection portion **18a** to support a contact element **17a** in a similar manner to that described with reference to Figs. 1 and 2.

Fig. 4 shows a further modified form of brush and brush holder in which the brush holder **30** has two diametrically opposed bent projecting portions **31**, **32** for receiving carbon contact brushes **33**, **34** which are pressed into electrical contact with the resistor track **1** and collector ring **2** respectively. In both modifications described under Figs. 3 and 4, the brush holder is intended to be hingedly mounted so that the brushes are pressed against their respective tracks.

I claim:

1. In a resistance device having a resistor track, a metallic collector ring, and terminal tags embedded in a moulded base, a brush holder, said brush holder is formed with prongs having a dimple at each end and a bent projection portion, a segmental non-metallic brush engaged by the dimple ended prongs, a second brush located in the bent projection portion of the holder said brushes being pressed into electrical contact with the collector ring and resistor track respectively.

2. In a resistance device having a resistor track, a metallic collector ring, and terminal tags embedded in a moulded base, a brush holder in which the brush holder has a perforated ear and a bent projecting portion, a carbon slug supported in the perforated ear and a carbon brush is supported by the bent projecting portion, said carbon slug and carbon brush being pressed into electrical contact with the collector ring and resistor track respectively.

3. In a resistance device having a resistor track, a metallic collector ring, and terminal tags embedded in a moulded base, a brush holder, said brush holder constituting a spring metal ring having two diametrically opposed bent projection portions on different pitch circles a carbon brush mounted in each of the bent projection portions in said holder, said brushes being pressed into electrical contact with the resistor track and collector ring respectively.

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