Feb. 27, 1951 R. W. SEARLE 2,543,673

GANGED POTENTIOMETER

Filed Feb. 14, 1949

Fig. 1

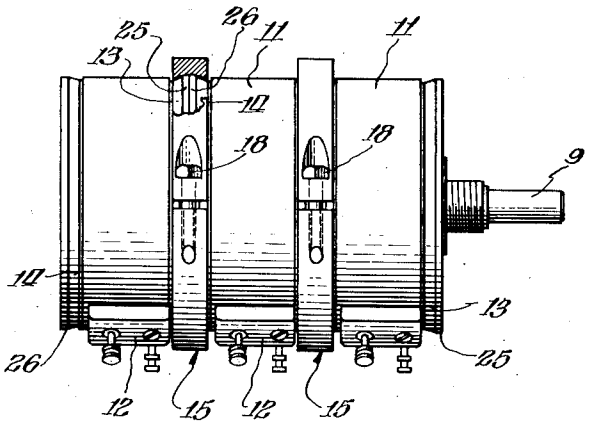


Fig. 2

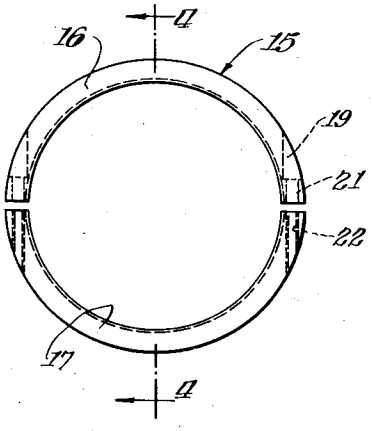


Fig. 3

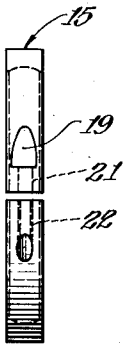


Fig. 4

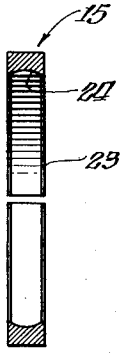
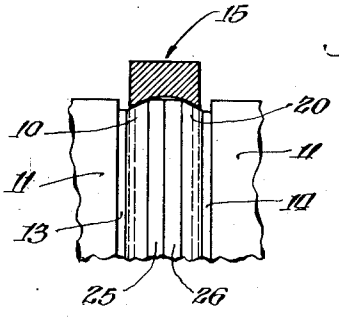


Fig. 5



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GANGED POTENTIOMETER

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5 Claims. (Cl. 201—48)

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The present invention relates to ganged precision adjustable resistors or potentiometers, and more particularly a provision whereby such gang resistors or potentiometers may be synchronized or adjusted relative to the unitary control knob or shaft.

In certain control and measurement circuits it is desirable to provide for the simultaneous control of a plurality of adjustable resistors or potentiometers. These potentiometers which are provided with a unitary control are of the precision type having an accuracy within one percent of the total resistance value. In aligning such resistors or potentiometers it has been found in the past that it was rather difficult to provide for adjustment or synchronization of the different resistor or potentiometer units relative to each other and relative to the unitary control shaft.

It is, therefore, an object of the present invention to provide an improved arrangement whereby the adjustment or synchronization of a plurality of precision type variable resistors or potentiometers may be obtained in a relatively simple manner.

Still another object of the present invention is to provide an improved clamping and fastening device for retaining together in ganged relation a plurality of potentiometers or adjustable resistors.

Other and further objects of the present invention subsequently will become apparent by reference to the following description taken in conjunction with the accompanying drawings wherein:

Fig. 1 shows the application of the present invention to a ganged potentiometer unit;

Fig. 2 is a plan view of a clamping ring employed in the ganged unit of Fig. 1;

Fig. 3 is a side view of a clamping ring shown in Fig. 2;

Fig. 4 is a cross-sectional view of the ring of Fig. 2 as seen in the direction of the arrows along the line 4—4; and

Fig. 5 is an enlarged view of a portion of Fig. 1.

A ganged potentiometer unit is shown in Fig. 1 as having a unitary control shaft 9 which extends into a plurality of potentiometers each having an outer casing 11. Each of the casings is provided with an electrical terminal assembly 12 whereby circuit connections may be made to the resistor and the adjustable contact of the potentiometer. Each of the casings 11 is provided at its front side with a groove 13 having an inclined surface 10; at its back side it is provided with a groove 14 having an inclined surface 20.

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The several potentiometers are retained together by a plurality of clamping rings 15 which engage the adjacent grooves 10 and 20 of the casings 11.

As is apparent from Fig. 3 each of the rings 15 is formed of an upper portion 16 and a lower portion 17 retained together by a plurality of cap screws 18 as shown in Fig. 1. At each side of the upper half of the ring 16 there is provided a recess 19 for receiving the head of the cap screw 18. The recess 19 is joined by a bore 21 for receiving the body of the cap screw 18. Each of the lower ring portions 17 is provided with a capped bore 22 for receiving the threaded portion of the cap screw 18.

From Figs. 3 and 4 it will be noted that the inner surface of each of the rings 15 has a chamfered edge 23 and the inner surface of each ring is slightly concave as is indicated by the surface 24 in Fig. 4 and Fig. 5. The slightly concave surface 24 engages the inclined surfaces 10 and 20 formed adjacent the grooves 13 and 14 so as to tend to draw together opposite surfaces of adjacent casings 11 of the potentiometer. This action also aligns the openings in the movable contact arms of the potentiometers with such precision that a unitary control shaft 9 readily passes through all of the movable contact arms, and the various potentiometers 11 without binding.

By means of measuring instruments the positions of the resistance units in their various casings 11 may be adjusted relative to each other so as to provide the desired synchronization or adjustment of one resistor relative to the other. This is accomplished by loosening slightly the clamping rings 15 until the desired adjustment has been obtained by grasping one casing with one hand and moving the adjacent casing with the other hand. Thereupon, the clamping ring between these two casings may be tightened. A similar procedure is followed for successive pairs of casings. By this arrangement the desired accuracy in the control may be obtained.

While for the purpose of illustrating and describing the present invention a preferred embodiment has been shown in the drawings, it is to be understood that the invention is not to be limited thereby since such variations in the construction are contemplated as may be commensurate with the spirit and scope of the invention as defined in the accompanying claims.

What I desire to protect by United States Letters Patent is claimed as follows:

1. The combination for adjusting a ganged assembly of precision variable resistors comprising a plurality of cylindrical casings each pro-

vided adjacent their front and rear sides with an annular ridge, a rigid clamping ring having a channel-like cross-section whereby the edges of the channel sides engage adjacent ridges of adjacent casings thereby to produce a force transverse to said ring to move together adjacent front and rear sides of the assembled casings, said clamping ring being formed in two parts, and means for tightening together said two parts of said clamping ring.

2. The combination for adjusting one resistor angularly relative to another resistor in a ganged assembly of precision variable resistors comprising a plurality of cylindrical casings each provided adjacent their front and rear sides with an annular ridge, a rigid two-part clamping ring having parallel edge surfaces for engaging adjacent ridges of adjacent casings without substantial engagement of the remainder of the casings, the contacting surfaces of said ring and said ridges having surfaces at angles to each other thereby to tend to force together adjacent front and rear sides of the assembled casings as said ring is tightened, symmetrically positioned means for tightening the parts of said clamping ring, and a common control shaft for said assembly.

3. The combination comprising a gang of precision potentiometers each having a cylindrical casing, an annular groove located adjacent the front side of said casing, a similar groove located adjacent the back side of said casing, said grooves each forming adjacent the sides of said casing a narrow ridge having a surface inclined toward the body of said casing, a rigid two part clamping ring located about said ridges where adjacent potentiometers meet, said ring having a recessed inner surface with the inner peripheral edges thereof engaging said inclined surfaces and extending partially into said grooves, and means for tightening the parts of each ring together.

4. The combination for adjustably ganging together a plurality of precision variable resistors to permit relative rotation therebetween comprising a cylindrical casing for each resistor, said casing having an annular groove located adjacent each of the front and back sides thereof to form narrow ridges, a rigid clamping ring formed in two similar parts having a concave inner surface for engaging only the rear and front ridges of adjacent casings, the inner edges of each ring extending partially into said grooves so as to be out of contact with the remainder of said casing, a plurality of screws for tightening each ring, and a common control shaft for said resistors.

5. The combination for adjustably ganging together a plurality of precision variable resistors in adjusted angular relation to each other comprising a cylindrical casing for each resistor, each casing having an annular ridge located adjacent each of the front and back sides thereof, each ridge having one inclined wall on the side toward the body of the casing, a rigid clamping ring formed in two similar parts each having a recessed inner surface whereby the parallel edges of each ring engage only the inclined sides of the front and rear ridges of adjacent casings, a plurality of screws for tightening each ring to lock in position adjacent resistors and to align the bearings thereof, and a common control shaft passing through the bearings of said resistors.

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