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F. GIEFFERS
VARIABLE RESISTORS
Filed Aug. 20, 1940

Serial No. 353,321

Fig. 1

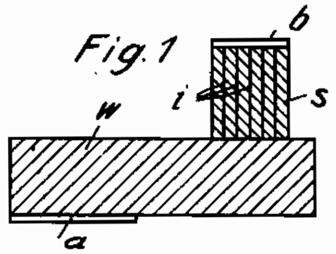


Fig. 2

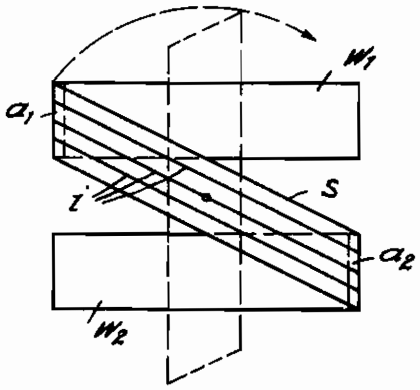
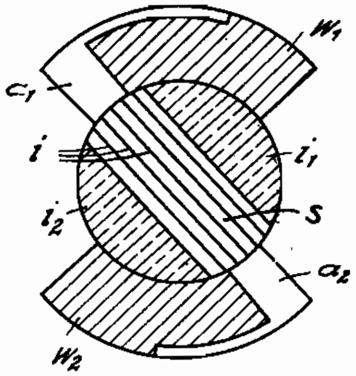


Fig. 3



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ALIEN PROPERTY CUSTODIAN

VARIABLE RESISTORS

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Application filed August 20, 1940

In the copending application Serial No. —, filed —, are illustrated and described variable resistors in which an undue crowding of the current paths at one edge of the corresponding contact surface may be prevented in various ways. Another possibility of preventing such a crowding of the current paths consists according to the invention in subdividing the resistor in insulating layers or layers of high specific resistance, extending in the desired direction of the current paths.

In the accompanying drawings are shown by way of illustration some forms of the invention. in which

Fig. 1 shows a variable resistor consisting of a prismatic resistor *w* and a rectilinearly shiftable contact;

Fig. 2 shows a rotatable contact associated with two straight resistors, and

Fig. 3 shows a rotatable contact associated with two arcuate resistors.

According to Fig. 1, a contact *s* consisting preferably also of resistance material slides over a resistor *w*, the contact being subdivided (laminated) perpendicularly to the contact surface into insulating layers or resistance layers *i*. The insulating layers lie also perpendicularly to the direction of current in the resistor. The resistor *w* is provided at the side opposite to the contacts *s* with a current junction *a*. The distribution of the current paths extending within both bodies between the current junction *a* and the current junction *b* is substantially uniform so that the contact edge is prevented from being too heavily loaded.

Fig. 2 shows an arrangement in which an approximately uniform distribution of the current paths is obtained by a symmetrical arrangement of two resistors. The two resistors w_1 and w_2 are bridged by a laminated contact *s*, preferably of good conductivity, lying crosswise with respect to the two bodies. The ends of the contact upon rotation of the contact are moved away from the current junctions a_1 and a_2 so that a resistance increasing in value is inserted in the circuit. Owing to the symmetrical arrangement, the various current paths extending within the contact have substantially the same length so that a concentration of the current in certain paths is prevented and therefore a crowding of the current paths. The lamination of the contact supports a uniform current distribution.

An improved arrangement of the above character is shown in Fig. 3, in which the resistors w_1 and w_2 are arcuate, the contact surface covered by the contact *s* forming a cylindrical surface. The insulating pieces i_1 and i_2 are associated with the conducting central portion of the contact to form a cylindrical body. The current junctions a_1 and a_2 of the resistors w_1 and w_2 respectively are arranged on the cylindrical surface in the manner as shown in Fig. 3 and extend over a considerable portion of length of the resistors. The specific resistance of the resistors may vary in a similar manner as the specific resistance of the embodiment shown in Fig. 5 of the above copending application; however, also homogeneous resistors may be employed as shown in Fig. 2. The contact is laminated in the direction of the desired flow of current. Depending upon the position of the contact, the latter inserts in the circuit more or less resistance. In the position shown the connection is practically without resistance.

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