

Sept. 13, 1932.

S. RUBEN

1,877,482

RESISTANCE DEVICE

Filed Sept. 17, 1928

FIG.1.

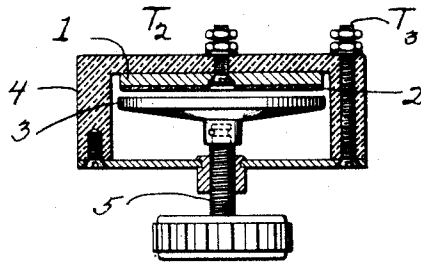
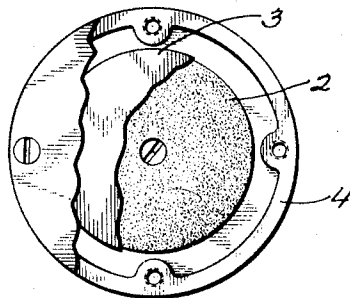


FIG.2.



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UNITED STATES PATENT OFFICE

SAMUEL RUBEN, OF NEW YORK, N. Y., ASSIGNOR TO RUBEN PATENTS COMPANY, OF
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RESISTANCE DEVICE

Application filed September 17, 1928. Serial No. 306,608.

This invention relates to an electrical resistor, and more particularly it relates to a variable resistance device utilizing the change of contact resistance of an electronically conductive oxide compound for current control. An object of the invention is the provision of a variable resistance device, the resistance value of which varies with changes of pressure only.

10 If a copper body having on its surface an integrally formed dense, homogeneous layer of cuprous oxide, as one electrode, is in surface contact with another metallic electrode and pressure is applied between the electrodes, the contact resistance at the junction of these members varies with the pressure applied.

15 It is necessary to have as one electrode a copper base with such integrally formed, homogeneous, dense, crystalline layer of cuprous oxide; this cuprous oxide layer must be opposite to a contacting conductive material as the other electrode. Without such a layer on the first electrode, formed as described, the oxide does not withstand mechanical and thermomechanical effects.

20 It is also necessary that the contact between the electrodes be upon surfaces as flat as may be practicable to obtain. For a better understanding of the invention reference is made to the accompanying drawing of one embodiment thereof, in which Fig. 1 shows an elevation, partly in section, of a resistance device, and Fig. 2 a plan view partly cut away.

25 In the drawing at 1 is a copper plate electrode at the lower side of which is a layer of fused cuprous oxide 2, the other electrode being an aluminum plate 3, in adjustable relationship with the cuprous oxide surface 2. The pressure between the contacting surfaces is varied by means of screw 5. The terminals of the two electrodes are respectively at T_2 and T_3 . All the members are mounted upon an insulation covered shell 4, composed of bakelite.

What I claim is:

1. An electrical resistance device comprising an electrode composed of a conductive material and a contacting electrode of copper having upon its surface adjacent to the other

electrode, an integrally formed, homogeneous, crystalline layer of a compound of copper and means for varying the resistance of the compound of copper by varying the surface pressure between the first mentioned electrode and the compound layer.

2. An electrical resistance device comprising an electrode composed of a conductive material and a contacting electrode composed of copper having on its surface an integrally formed homogeneous crystalline layer of cuprous oxide and means for varying the resistance of the cuprous oxide material by varying the surface pressure between the first mentioned electrode and the cuprous oxide.

3. A variable electrical resistance device comprising an electrode composed of a conductive material in surface contact with another electrode composed of a copper base having an integrally formed homogeneous crystalline layer of cuprous oxide, and means for varying the pressure between the electrodes.

In testimony whereof, SAMUEL RUBEN has signed his name to this specification this 14th day of September, 1928.

SAMUEL RUBEN.