

(No Model.)

J. WARING.
RHEOSTAT.

No. 479,101.

Patented July 19, 1892.

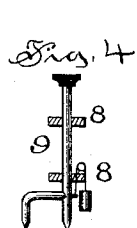
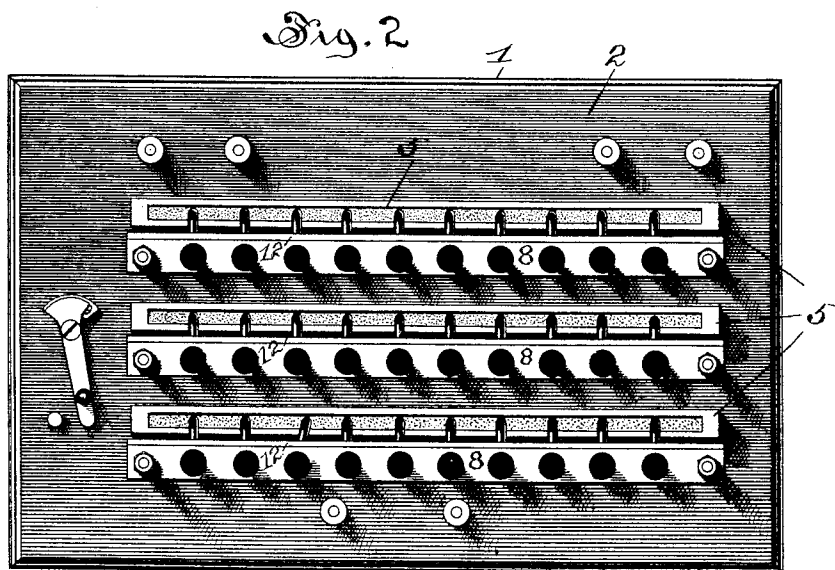
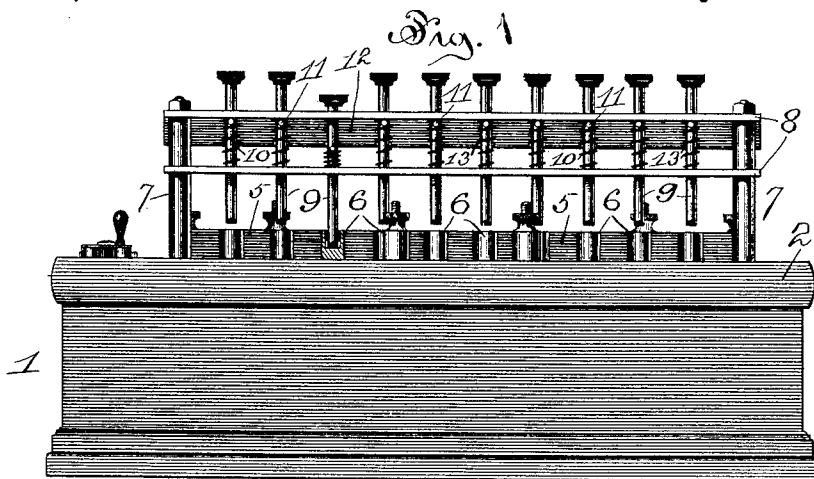
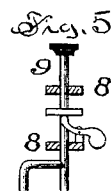
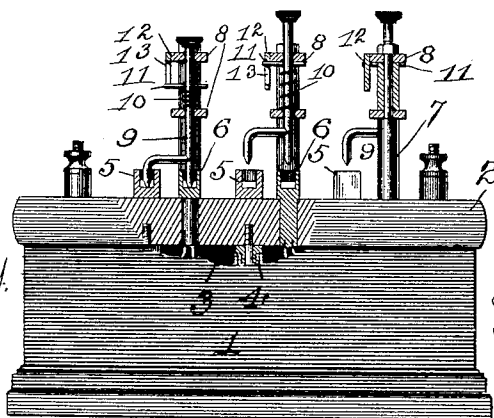


Fig. 3



Witnesses:

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UNITED STATES PATENT OFFICE.

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To all whom it may concern:

Be it known that I, JOHN WARING, a citizen of the United States, residing at Manchester, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Resistance-Boxes, of which the following is a full, clear, and exact specification.

This invention relates to the class of instruments provided for accurately determining electrical resistances and making similar measuring-tests, the object being to provide such a box with plugs or bridges, which are always in position for use, normally just above or adjacent to the contacts, and by slight pressure can be brought into contact with the conducting parts to throw out the desired coils, but which are so balanced that when such pressure is removed they will automatically withdraw from the contacts, whereby tests may be made with great rapidity.

Referring to the accompanying drawings, Figure 1 is a side elevation of the box. Fig. 2 is a plan. Fig. 3 is an end elevation with parts in section; and Figs. 4 and 5 are detail views of plugs, illustrating different means for balancing them.

In the views, 1 indicates the bottom or base of the box, which is made of wood or a similar insulating material with a top or slab 2 of some material having the highest possible electrical non-conductivity, usually hard rubber with a highly-polished surface. In the chamber 3 in the box, secured to the under side of the slab of insulation in the customary manner, are the coils 4 of predetermined or known resistance, which are connected with each other and with the contacts 5 and 6, attached to the upper side of the insulation in any ordinary manner.

In the form shown the contacts 5 consist of a number of troughs, of copper or a similar conducting material, containing mercury, while the contacts 6 are cups, of a similar metal containing the same liquid, arranged in rows parallel with the troughs and separated from each other by air or other insulation. Near each end of the rows of cups are posts 7, which are connected by plates 8, and above each cup, loosely supported so as to slide in

perforations through the plates, are rods or plugs 9, formed, preferably, of pure copper with an insulating-head and a projecting arm to bridge from cup to trough. In the form shown in Figs. 1, 2, and 3 these plugs, which slide freely through the perforations in the plates, are balanced so as to be held in a raised position by spiral springs 10, that thrust upward from the lower plates against pins 11, that pass through the plugs. Along one edge of the upper plates is a flange or strip 12, having in its edges notches 13, in which the pins 11 slide, so as to keep the plugs from rotating as they are moved up and down. When a plug is depressed, it bridges the space between a cup and trough by dipping into the mercury in each and forming an electrical path, so as to throw out certain of the coils, and when the pin 11 has reached the bottom of its notch 13 a slight rotation of the plug catches the pin under the edge of the strip 12, so that the plug will not rise under the influence of the balance.

In the form shown in Fig. 4 the bridge is illustrated as balanced or held in a raised position by a cord and weight, while in Fig. 5 this is accomplished by a weighted lever. Of course, if desired, the plugs or bridges can be made of any suitable shape, and may bridge or connect solid metal contact blocks or bars to which the resistance-coils are connected, instead of dipping into mercury contacts, without departing from the invention.

In use any of the bridges may be depressed by the fingers and held down so long as pressure is exerted and then allowed to rise under the influence of the counterbalancing spring or weight, or they may when down be slightly rotated so that the pins will prevent them from rising.

The box is simple and cheap in construction, and when in use a large number of tests can rapidly be made, as the resistances can be thrown in or out so quickly, for the plugs are always in position ready for use and do not have to be fitted into a socket, and when depressed will automatically rise from the contacts.

I claim as my invention—

1. A resistance-box consisting of a base with

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an insulating-slab, bearing binding-screws, switches, coils, and contacts, with bridges movably supported adjacent to the contacts and held therefrom by a counter-balance, substantially as specified.

2. A resistance-box consisting of a base with an insulating-slab, bearing binding-screws, switches, coils, and contacts, with bridges movably supported above the contacts and held raised by a counter-balance, said bridges being provided with a stop, whereby they may be held depressed, substantially as specified.

3. A resistance-box consisting of a base with an insulating-slab, bearing binding-screws, switches, coils, and contacts, plates supported

above the contacts, bridges movably borne by the plates and held raised by counter-balances, said bridges having pins which in their lower position may engage a strip on one plate to keep the bridges down, substantially as specified.

4. A bridge for a resisting-box, consisting of a plug of conducting material, an insulated support adapted to engage a box, and a counter-balance for holding the plug in the support away from the box, substantially as specified.

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Witnesses:

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