No. 757,687. PATENTED APR. 19, 1904.

I. E. STOREY.

RHEOSTAT.

APPLICATION FILED SEPT. 2, 1903.

NO MODEL.

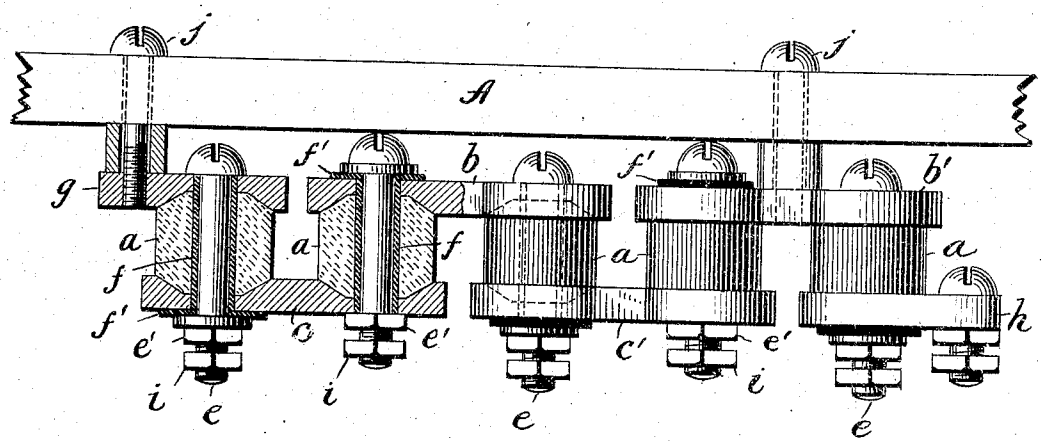

Fig. 1.

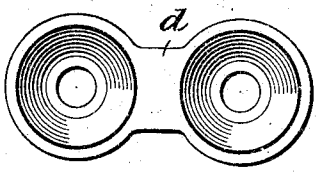

Fig. 2.

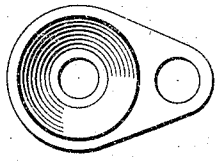

Fig. 3.

Witnesses
Paul A. Ober
Waldo M. Chapin

Inventor
Imle E. Storey
By his Attorney
M. M. Rosenbaum

No. 757,687. Patented April 19, 1904.

UNITED STATES PATENT OFFICE.

IMLE E. STOREY, OF AMSTERDAM, NEW YORK.

RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 757,687, dated April 19, 1904.

Application filed September 2, 1903. Serial No. 171,602. (No model.)

To all whom it may concern:

Be it known that I, IMLE E. STOREY, a citizen of the United States, residing at Amsterdam, in the county of Montgomery and State of New York, have invented certain new and useful Improvements in Rheostats, of which the following is a full, clear, and exact description.

This invention relates to rheostats, and has special reference to the construction and manner of mounting the resistance elements with a view to subdividing or connecting various portions of them in circuit at will and with the least work.

A further object is to provide a construction comprehending certain units, any number of which can be used to build up the resistance element of the rheostat to any required size.

My invention will be described in detail with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a portion of a base-plate and my improved resistance element attached thereto, parts being in section. Fig. 2 is a face view of one of the connectors or couplings, and Fig. 3 is a similar view of the end coupling.

Referring to the drawings, A indicates the usual base-plate or support, of slate or other insulating material commonly used for this purpose.

The resistance element consists of graphite or carbon in the form of tubes, as indicated at *a*. These tubes may be of any desired length, they being shown very small and similar to beads or buttons in the drawings. These graphite tubes for a given rheostat will be all of the same size and shape.

b and *b'*, *c* and *c'* are metallic heads or connectors, each consisting of two disk-like ends, as shown in Fig. 2, connected by a web *d*. The disk-like ends have in one face a conical or cup-like depression into which the end of the graphite tube fits, and each disk-like portion is also perforated centrally, as shown. These connectors are adapted to be applied to either end of the resistance elements. They are arranged in two sets, one set (indicated by *b* and *b'*) being applied to one set of ends of the resistance elements, while the other set, *c* and *c'*, are applied to the other set of ends of the elements.

e indicates bolts or threaded rods which are adapted to pass through the connecting-heads and the resistance elements to secure or bind the parts together. These rods preferably have an integral head on one end and a removable head consisting of a nut *e'* on the other end. The parts are assembled so that the rod is insulated from the graphite resistance element *a* and from one of the connecting-heads *b* or *c* by an insulating-sleeve *f* and a washer *f'*; but it is in contact with the other connecting-head.

g and *h* are terminal connecting-pieces having a single conical seat for the end of the resistance element and a perforation for a binding or supporting screw, as shown in Fig. 3.

The complete rheostat is assembled in the following manner: The first resistance element *a* is clamped between the connectors *g* and *c*, the bolt *e* being inserted and insulated in such a manner that its inner or rearward head is in electrical contact with the connector *g* only. Next the second resistance element *a* is clamped between the connector *c* and the connector *b*, the bolt in this instance being insulated from all parts except the connector *c*, the outer head of the bolt resting in contact with the latter. The third resistance element *a* is clamped between the connector *b* and the connector *c'*, and the bolt is inserted so as to be in electrical connection with the connector *b* only. The fourth resistance element is clamped between connector *c'* and connector *b'*, with the bolt in contact with *c'*. In the same manner any number of resistance elements may be connected together with the bolts alternately arranged in contact with the front and back connectors. The final resistance element has attached to it the connector *h*. It will thus be seen that the several resistance elements *a* are electrically connected in series by means of the connectors *b b'* and *c c'*. This method of construction furnishes ready means for assembling the various parts and at the same time affords good contact between the metal terminals and the graphite buttons or tubes.

Another important advantage of my invention resides in the fact that by reason of the alternate arrangement of the threaded rods or bolts with respect to insulation from the other parts I am able to attach connecting-wires to the outer ends of the bolts wherever desired to divide up the entire resistance into parts. For instance, by connecting one wire with the outer end of the first bolt and a second wire with the outer end of the second bolt there will be one resistance between the two wires. If I connect the second wire with the outer end of the third bolt, there will be two resistance elements between the two wires. Likewise if I connect the third wire with the outer end of the fourth bolt there will be three resistance elements between the two wires. Also the two wires can be connected to any two adjoining bolts, and one resistance element will always be between them. This, it will be seen, is accomplished without the necessity of making the connections at the inner ends of the resistance elements, where the space is narrow and the bolts are difficult of access. I therefore place binding-nuts *i* for wire conductors on the outer end of each of the threaded rods. Any of the connectors *b*, *c*, *g*, or *h* furnish convenient means for fastening the resistance to the base A by the screws *j*.

The conical ends of the resistance element, which fits into correspondingly-shaped sockets in the metal heads, in connection with the clamping-rod which binds them together, furnishes an excellent means for mounting the resistance element, since by setting up the nuts on the rods the conical parts can be forced into intimate contact with each other.

Having described my invention, I claim—

1. In a rheostat, a resistance element consisting of a tube of graphite or similar material, in combination with metallic heads and a rod passing through the tube and engaging with the heads to clamp them against the ends of the tube.

2. In a rheostat, a resistance element consisting of a tube of graphite or similar material having conical ends, in combination with metallic heads having conical seats for said ends, and a rod passing through the tube and engaging with the heads to clamp them against the ends of the tube.

3. In a rheostat, the combination of a plurality of parallel tubular resistance elements, metallic connectors along each set of ends thereof and connecting the elements in series, and rods passing through the elements and securing the connectors to the opposite ends thereof.

4. In a rheostat, the combination with a plurality of tubular resistance elements, metallic end pieces connecting them together in series, and insulated rods extending through the tubes and respectively in contact alternately with end pieces at opposite ends of the elements.

5. In a rheostat, the combination with a plurality of parallel resistance-rods, metallic connectors along each set of ends of the rods, connecting the rods in series, and a series of binding devices arranged along one set of ends of the rods and electrically connected alternately with the two sets of metallic connectors, for the purpose set forth.

6. In a rheostat, the combination of a plurality of parallel tubular resistance elements, metallic connectors along each set of ends thereof and connecting the elements in series, and rods passing through the elements and securing the connectors to the opposite ends thereof, said rods being in electrical connection with one of the metallic connectors only, and binding devices for wires carried by each rod.

7. In a rheostat, the combination of a plurality of tubular parallel resistance elements, metallic heads or connectors connecting the elements in series, headed rods passing through the elements and connectors to hold them together and insulating material interposed between the rods and the elements and between one of the heads of the rods and the connector, for the purpose set forth.

In witness whereof I subscribe my signature in presence of two witnesses.

IMLE E. STOREY.

Witnesses:

WM. A. ROSENBAUM,

WALDO M. CHAPIN.