

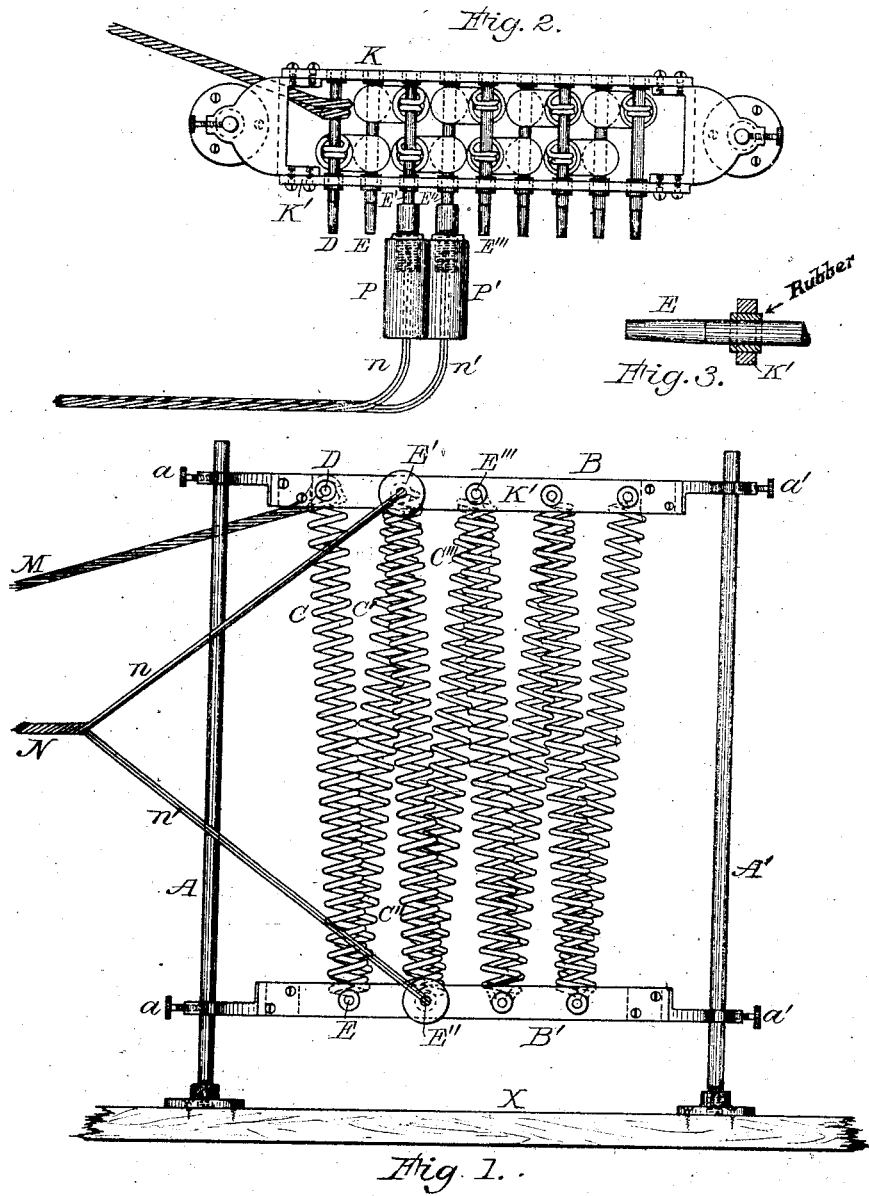
(No Model.)

J. W. PACKARD.

RHEOSTAT.

No. 385,001.

Patented June 26, 1888.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JAMES WARD PACKARD, OF NEW YORK, N. Y.

## RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 395,001, dated June 26, 1888.

Application filed May 19, 1888. Serial No. 274,436. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES WARD PACKARD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Rheostats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is to produce a rheostat for heavy currents which can be cheaply made, easily repaired, and will not heat.

In the drawings, Figure 1 represents my rheostat in side elevation. Fig. 2 is a plan of the same. Fig. 3 is a detail view showing the insulation between the cross bar and the divided portions of the sides of the frame.

The frame of my rheostat consists of the two vertical standards A and A', which are screwed to the bed-piece X. Upon these standards are adjustably placed the cross-pieces B B', which are held in place by the set-screws a a'. These cross-pieces B B' are made in two divided portions, K K', as clearly shown in Fig. 2. Passing through or resting upon these divided portions of the cross-pieces are the cross-bars D E E' E'', &c. These cross-bars are insulated from the cross-pieces by the hard-rubber rings, as shown in the detail view, Fig. 3. Upon the cross-bars D E E', &c., are strung the resistance-coils C C' C'' C''', &c. Consequently these resistance coils, being arranged in the manner shown, are connected up in series.

The cable M furnishes a permanent electric connection between one terminal of the external electric circuit and the cross-bar D, which latter is one terminal of the internal circuit of the resistance-coils. The cable N furnishes the other terminal of the external electric circuit. Connected with the cable N are two branches, n n', which terminate in socket-pieces P P'. (Most clearly shown in Fig. 2.) These socket-pieces fit over the ends of any of the cross-bars, E E', &c., and can be shifted from one cross-bar to another by hand.

In operation my rheostat is placed in circuit by connecting the terminals of the said circuit to the cables M and N. To vary the resistance it is only necessary to remove one of the socket-

pieces P P' from the cross-bar on which it rests and shift it to another further from or nearer to the cross-bar D, according as it is desired to increase or decrease the resistance to be thrown in circuit. The shifting of one of the socket-pieces P in this manner does not break the circuit, since the contact is complete at the other socket-piece and the path of the current is unbroken. In using the rheostat it is evident of course that the resistance offered will be equal to the sum of the coils between the bar D, having the permanent connection and the nearest socket-piece, since the current will be short-circuited through the branch, n or n', which presents the least resistance.

The advantages of my construction are obvious. There is no wood or other inflammable material to be charred by the heating effects of heavy currents. The rheostat is open for the passage of air through every part, and thus the heating effects are largely counteracted. Every portion of the rheostat is exposed to the eye of the operator and can be gotten at readily for repairs, if any are necessary. There is always a perfect contact between one of the socket-pieces and the cross-bar upon which it rests, so that there is no sparking and wearing of the contact-surfaces when the rheostat is in use, as is frequently the case in other forms of apparatus of this nature.

Having therefore described my invention both in essence and detail, what I claim as new and desire to protect by Letters Patent, is—

1. A rheostat which has two independently-adjustable contact-pieces to afford connection between one terminal of the external circuit and the internal circuit of the resistance-coils, substantially as described.

2. A rheostat which has two independently-adjustable contact-pieces to afford connection between one terminal of the external circuit and the internal circuit of the resistance-coils, said contact-pieces being in shunt relation one to the other, substantially as described.

3. A rheostat which has the following parts in combination: a skeleton frame, a set of resistance-coils connected in series and insulated from the frame, an electrical connection between one end of the series and one terminal of the external circuit, and two independently-adjustable contact-pieces which afford connec-

tion between the other terminal of the external circuit and the resistance-coils, substantially as described.

4. A rheostat which has the following parts in combination: a skeleton frame, a set of resistance-coils connected in series and insulated from the frame, an electrical connection between one end of the series and one terminal of the external circuit, and two independently-adjustable contact-pieces which afford connection between the other terminal of the external circuit and the resistance-coils, said contact-pieces being in shunt relation one to another.

5. A rheostat which has the following parts in combination: a skeleton frame which has suitable cross-bars resting on divided portions

of two of its opposite sides, but insulated therefrom, a set of resistance-coils strung on said bars and connected in series, an electrical connection between one terminal of the exterior circuit and one end of the series of coils, and two socket-pieces which are electrically connected to the other terminal of the exterior circuit, and which fit over the projecting ends of any of the said cross-bars, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES WARD PACKARD.

Witnesses:

JNO. M. ROBERTSON,  
CHAS. H. GÖRNE.