

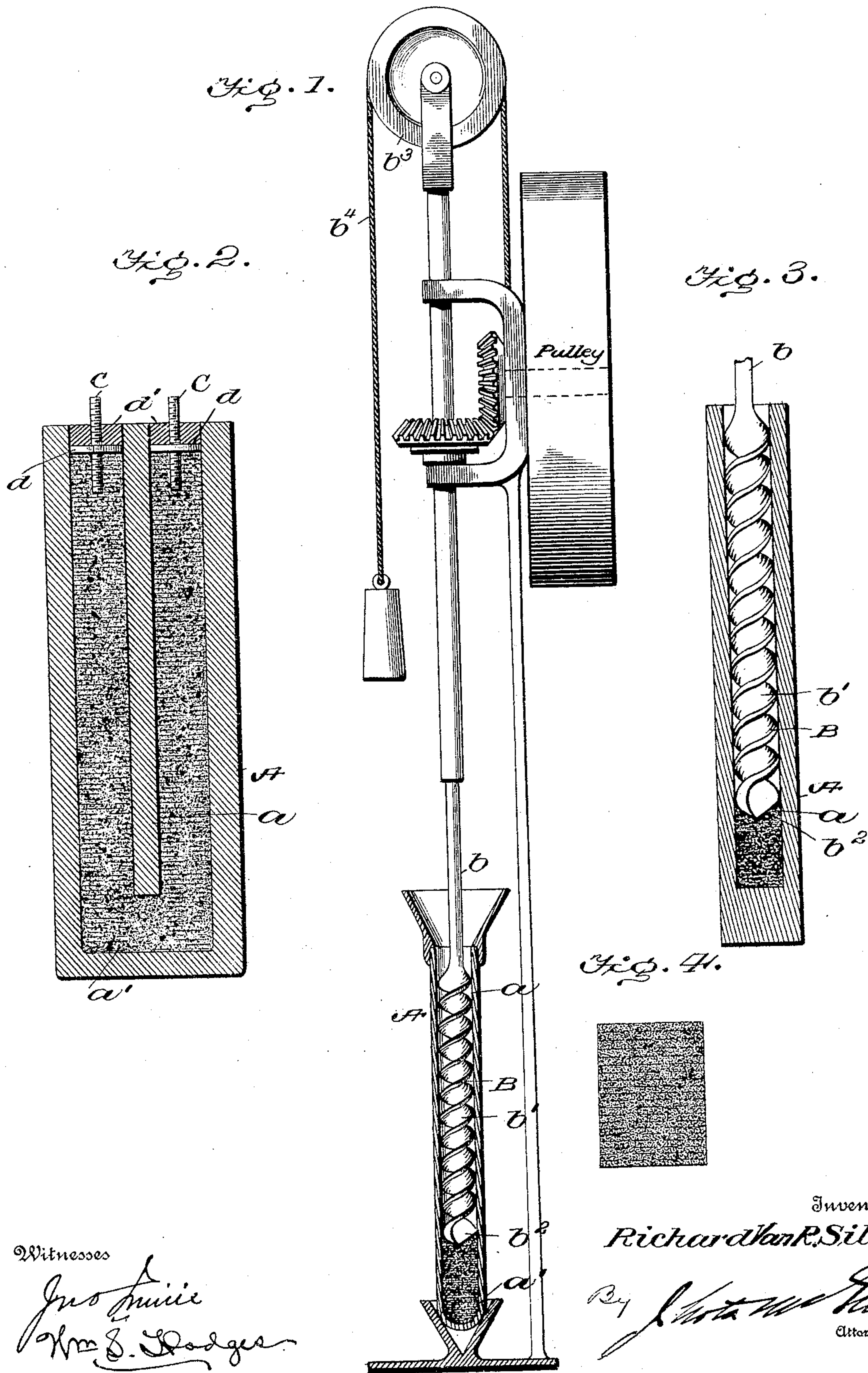
No. 606,769.

Patented July 5, 1898.

R. VAN R. SILL.
ELECTRIC HEATER OR RHEOSTAT.

(Application filed May 29, 1897.)

(No Model.)



Witnesses

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UNITED STATES PATENT OFFICE.

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ELECTRIC HEATER OR RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 606,769, dated July 5, 1898.

Application filed May 29, 1897. Serial No. 638,819. (No model.)

To all whom it may concern:

Be it known that I, RICHARD VAN RENSSELAER SILL, of New York, in the county of New York and State of New York, have invented
5 certain new and useful Improvements in Electrical Heaters or Rheostats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as
10 it appertains to make and use the same.

This invention contemplates certain new and useful improvements in electrical heaters, having reference to that class of radiators employing a comminuted resistance in lieu of
15 wires.

In Letters Patent of the United States No. 565,574, issued August 11, 1896, I showed and described a hermetically-sealed radiator having longitudinal bores wherein I placed a com-
20 minuted resistance, electrodes being placed in contact therewith, so that an electric current could be made to travel through the said resistance, in at one end and out at the other.

Practice has demonstrated that it is highly
25 essential to the successful use of radiators so equipped that the resistance be uniform throughout—that is, if the comminuted substance be more densely packed at one point than another the heating of the radiator will
30 lack uniformity, being heated at the points of least density to a higher degree than at other points where it is tight.

The object of the present invention is therefore to produce an electric heater or rheostat
35 in which the resistance filling of comminuted material will be of substantially uniform density throughout its length, which object is attained by depositing the resistance material in a spiral layer with the convolutions in
40 contact.

The resistance, which has preferably as its essential components carbon and soapstone, is fed into the bore surrounding the feeder,
45 and as the latter is rotated the compound will pass around its worm or spiral and be deposited at the lower end thereof in uniform layers. As this deposit occurs the weight of the feeder serves to make the mass solid throughout its length, its solidity being uniform at every

point. As the bore is thus filled to near its
50 end with the powdered compound the feeder is removed and a suitable electrode is inserted, the same preferably consisting of a screw-rod having a nut fitting snug within the bore, the whole being held by Babbitt metal surround-
55 ing the screw-rod.

To enable the invention to be more clearly understood, I will refer to the accompanying drawings, in which—

Figure 1 is a view showing a heater in process of being supplied with its comminuted re-
60 sistance, the mechanism for operating the feeder, as well as the latter, being shown in elevation, while the heater is in section. Fig. 2 is an enlarged vertical sectional view of the
65 heater ready for use. Fig. 3 is another sectional view of the heater, taken through one of the bores, showing the feeder in position. Fig. 4 is an enlarged or exaggerated view of a section of the resistance compound.
70

Referring to the drawings, A designates a radiator having a longitudinal bore *a*, the form shown in Fig. 2 being provided with two parallel bores communicating at one end, as
75 at *a'*, the outer ends of the bores being open; but I do not restrict myself to any form of radiator, the essential requirement being, however, a cylindrical bore.

B is the feeder, which consists of a rod having an upper reduced shank *b* and a screw or
80 spiral-like portion *b'*; the extreme lower edge *b²* of which is reduced and made flat, but is not pointed. The greatest diameter of the screw portion of the feeder-rod is about equal to that of the bore of the radiator, so that the
85 spiral will contact with the interior of the bore. Any suitable means may be employed for rotating the feeder and likewise for weighting the same. I have shown a small wheel *b³* on the upper end of the feeder-rod,
90 over which is passed a weighted rope *b⁴*. As the feeder-rod is rotated and the resistance compound is inserted in the open end of the bore it will pass down around the spiral and be deposited in the bore in thin layers one
95 upon the other, but all thoroughly packed together by reason of the weight of the feeder. As each bore is filled to near its open end the

feeder is removed and a threaded rod C is inserted. On this rod is a nut d , which practically corresponds to the diameter of the bore, forming a stop for Babbitt metal, as at 5 d' , by which the ends of the bores are hermetically closed. Thus it will be seen that the comminuted resistance is so packed within the radiator in spiral form with contacting convolutions that it presents a uniform density throughout its entire length or depth, the 10 compound being deposited in equal layers as the feeder is rotated and rises upon its own deposit. In this way the danger of obtaining an unequal heat at any point is successfully 15 avoided.

The advantages of my invention will be at once apparent to those skilled in the art, but may be briefly stated as follows: First, the resistance being equal at all points there will 20 be no heating in spots, thereby avoiding cracking and breaking of the shell or tube due to unequal expansion and contraction; second, owing to the convoluted or spiral form of the resistance material there can be no transverse 25 fracture thereof by expansion and contrac-

tion, since even though two convolutions should partially separate during contraction the continuity of the spiral will remain unbroken and the passage of the current permitted. 30

I claim as my invention—

1. An electric heater or rheostat consisting of an outer shell, and a resistance filling therein in the form of a spiral layer of comminuted material with the convolutions in contact, substantially as set forth. 35

2. An electric heater or rheostat consisting of an outer shell, a densely-packed resistance filling therein in the form of a spiral layer of even thickness with the convolutions in contact, and electrodes in the ends of the shell, 40 substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

RICHARD VAN RENSSELAER SILL.

Witnesses:

MICHAEL J. COHALAN,
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