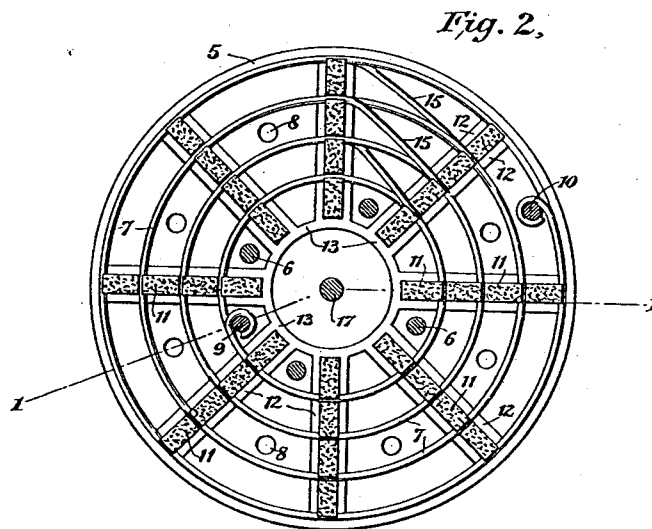
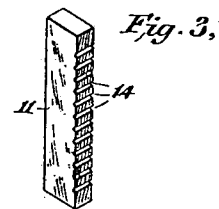
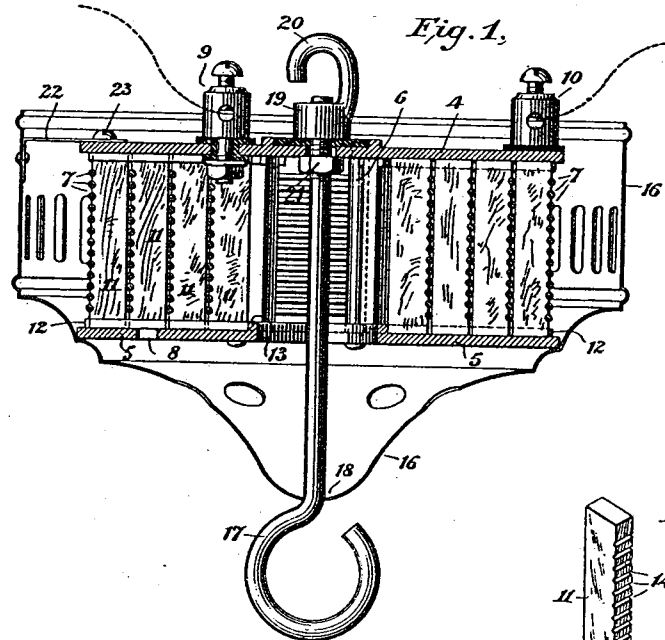


(No Model.)

A. WIRSCHING.
ELECTRIC RESISTANCE BOX.

No. 474,073.

Patented May 3, 1892.



Witnesses
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UNITED STATES PATENT OFFICE.

ALOYS WIRSCHING, OF NEW YORK, N. Y.

ELECTRIC RESISTANCE-BOX.

SPECIFICATION forming part of Letters Patent No. 474,073, dated May 3, 1892.

Application filed March 18, 1891. Serial No. 385,499. (No model.)

To all whom it may concern:

Be it known that I, ALOYS WIRSCHING, a citizen of the United States, residing at New York, county and State of New York, have invented certain new and useful Improvements in Electric Resistance-Boxes, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention consists in the various novel and peculiar combinations and arrangements of the several parts of an electric resistance-box or rheostat, all as hereinafter fully described, and then pointed out in the claims.

In the accompanying drawings, illustrating a resistance-box or rheostat made after the manner of my invention, Figure 1 is a view of a section, taken on a plane indicated by the line 1 1, Fig. 2. This view shows a resistance-box mounted within a ceiling block or fixture adapted for use with an electric-arc lamp, the fixture being shown in central vertical section. Fig. 2 is a view of the box with one of the frames or plates removed to expose the interior of the apparatus, the cross-pieces for securing the frames together being shown in cross-section. Fig. 3 is a perspective view of one of the removable spacing-blocks for spacing the layers of the windings.

Referring to the drawings, in which like numbers of reference designate like parts throughout, the numbers 4 and 5 designate a pair of frames or plates which are secured together in parallel position by means of suitable cross-pieces or pillars 6 6, with a suitable space between them for the windings of the electric conductor or wire 7, forming the artificial resistance. These frames or plates may be made in any desired and suitable shape—for instance, in spider or skeleton form—though they are here shown as disk like. By preference the frames are made of porcelain, though any other insulating material may be employed that is infusible. If desired, the frames may be made of metal and the binding-posts and windings suitably insulated therefrom, and they may be formed of conveniently-arranged ventilating-openings, such as 8.

The electric conductor or wire 7 is connected in circuit by way of the binding-posts 9 and

10, which are mounted upon one of the frames, and leading from the post 9, at a point near the center of the frame 4, the wire 7 is wound in layers, which gradually approach the outer extremity of the frame, where its other end is secured to the post 10.

The spacing of the layers of wire 7 for the purpose of insulation and ventilation is effected by means of the novel spacing-blocks 11 11, which are of an elongated rectangular shape, though the shape of course may be varied. These blocks are separable and are set between the frames 4 and 5 endwise, being placed in position as the layers of the windings are built up successively. They are to be made of a suitable insulating material that is preferably infusible or refractory—such, for instance, as lava, slate, or porcelain. In order to guide the blocks when inserting them and to hold them in alignment with each other so as to maintain them in substantially the same plane, which latter is especially desirable for the reason that a firmer bed is thereby provided for each layer, I form the inner or opposing faces of the frames 4 and 5 with the guideways 12. Either one or both of the frames may be thus provided with guides, and I prefer to have both of them so provided. The guideways 12 are arranged radially and at equal intervals, if preferred, and are similarly disposed on each frame, so as to lie directly opposite each other—that is, a guideway 12 of the frame 4 is diametrically opposite to one on frame 5—so that the blocks 11 may be inserted between the frames with their respective ends taking into opposite guideways 12.

The guideways 12 consist in suitably-formed grooves, which may be cast or formed with the frames, and their ends near the outer edges of the frames are open for the reception of the spacing-blocks 11, which, after being thus inserted, may be slid along the guides toward the center of the frames. The inner ends of the ways or grooves 12 are closed or formed with a stop 13, against which the innermost block abuts. As the closed ends of the ways are equidistant from the center or axis of the frames, the inner row of blocks 12 will be arranged on a circle, the center of which is common to the axis of the frames, and as the wire is wound and the blocks built in they will fall

in a series of concentric circles, as will be understood from Fig. 2. The blocks themselves serve to space the layers of the wire 7, and each strand or turn of the layers is spaced or held apart from its adjacent ones by means of the serrations or series of notches 14 14, formed in one of the long edges of the blocks, the wire being directed into and placed in the notches as it is wound across the blocks. The portions of the wire marked 15 in Fig. 2 are the stretches of wire crossing from one layer to the next.

In constructing the apparatus the inner end of wire 7 is made fast to the post 9, from where its winding begins. At the start a single block 11 is inserted between the frames and slid along the guides to the inner ends thereof until it meets with the stop 13, which in the present construction consists in an annular rib or projection acting in conjunction with all the guides. As the first strand of wire is gradually bent around, the inner circle or row of blocks 11 is set in position, the wire being laid in the notches thereof toward the ends of the blocks nearest the frame 4. A second turn of the wire follows the first, the wire being laid in the notches 14 of the blocks next to the end notches, and thus the turns are made until the layer is completed. The initial layer binds the inner row of blocks 11 in position, and then as the winding of the second layer is begun the first block 11 of the second row or circle of blocks is inserted in the guides and slid into position, being forced in toward the axis of the frames into firm engagement with the first layer of the wire 7, with its serrated edge 14 looking outwardly. Then the second row or circle of blocks is built in as the winding proceeds, and so on with the remaining rows and layers until the winding is completed, the outer end of the wire being secured to the post 10 after the last layer has been wound. Of course as many layers of the winding may be employed as is necessary or desirable, the number here shown being four.

It will be observed that the spacing-blocks 11, when set properly in position, fall in planes containing the axis of the frames. By virtue of having these blocks arranged in planes which contain the axis referred to or not a firm bed is provided for each strand of the winding, since the inner blocks 11 bear against the stops 13, and the next adjacent blocks of the second row or circle from the center bear virtually directly against the inner blocks, and so on, the pressure on each block being sustained by the next adjacent block toward the center of the frames. This will give a desirable stability to the winding and will also serve to hold the spacing-blocks firmly in position, as the bending or springing of the strands of wire under pressure of the winding is rendered almost impossible. The spacing of the layers and that of the strands or turns in each layer may be made as great as desired, and each layer and turn

will be thoroughly ventilated and all necessary parts completely insulated.

The device may be used for any of the well-known purposes for which artificial resistances are employed in electrical apparatus. I have shown its use in conjunction with a ceiling block or fixture of an ordinary electric-arc lamp. This fixture comprises a metallic casing 16, having an open top and formed with an ornamental exterior and provided with ventilating-holes, as will be understood from Fig. 1. Each of the frames 4 and 5 is formed with a central opening for the hanger rod or hook 17 to pass through, the lower part of said hook passing through an opening 18 formed in the bottom of the casing 16. The end of the stem of the hook 17 is screw-threaded, and a nut 19, which works thereon, is provided with a hook 20. A jam-nut 21 is also located on the screw-threaded stem of hook 17 and takes against the under side of frame 4. By this means the hook 17 may be secured firmly to the box, which is set within the casing 16 and held fast therein by means of suitable clips 22, which extend from the casing and are attached to the frame 4 by screws 23. The lamp is to be suspended from the hook 17, while the fixture or ceiling block is to be attached to any suitable object by means of its hook 20, the resistance-coil 7 being connected up with the lamp in the usual way.

My improved device can be easily and cheaply made, it being of such a simple construction, and as the frames 4 and 5 are made of an indestructible insulating material, porcelain, and the spacing-blocks constructed of a similar material, such as lava, it will be impossible to burn out these parts. Hence the life of the apparatus will be greatly increased.

Having thus described my improvements in resistance-boxes or rheostats, what I claim as my invention, and desire to secure by Letters Patent, is—

1. In a rheostat or resistance-box, the combination, with two suitably-spaced frames or plates having the inner or opposing face of one or both provided with guideways, of spacing-blocks made of insulating material and fitting in the guideways and between the frames, and a wire wound in spiral layers with the spacing-blocks interposed between the layers for supporting and ventilating the wire.

2. In a rheostat or resistance-box, the combination, with two suitably-spaced frames having the inner or opposing face of one or both of them provided with guideways, of spacing-blocks made of insulating material and placed in the guides between the frames and having an edge thereof formed with notches or serrations for receiving and supporting the strands of the wire, and a wire wound in spiral layers, with the spacing-blocks interposed between the layers for spacing them.

3. In a rheostat or resistance-box, the combination, with suitably-spaced parallel frames

or plates having their opposing faces provided with guideways arranged similarly and directly opposite each other, of spacing-blocks made of insulating material and adapted to be inserted in between the frames, with their opposite ends taking in diametrically-opposite guideways thereof, and a wire wound spirally in layers between the frames, said blocks interposed between the layers of wire and serving to support and space them.

4. In a rheostat or resistance-box, the combination, with suitably-spaced parallel frames having their opposing faces provided with radially-arranged guideways radiating from a common axis and lying directly opposite each other, of a wire wound in spiral layers between the frames, and spacing-blocks made of insulating material and interposed between the said layers for supporting and spacing the wire, the opposite ends of said blocks taking in opposite guideways.

5. The combination, with a suitable frame and the wire 7, wound in concentric spiral layers, of the spacing-blocks 11, made of insulating material, interposed between the layers as the winding is built up and having opposite edges thereof engaged by adjacent layers between which they are interposed for spacing the layers, and the strands or turns of the layers, substantially as and for the purpose set forth.

6. The combination, with a suitable frame and the wire 7, wound in concentric spiral layers, the sets of spacing-blocks 11, made of insu-

lating material and interposed between the layers and having two opposite edges thereof engaged by adjacent layers between which they are interposed for spacing the layers, and the turns or strands of the layers, the blocks of each set being arranged radially in the same plane, so that the stress on the blocks beyond the innermost block may be imparted to each other in a direct line, substantially as and for the purpose set forth.

7. The combination, with the frames 4 and 5, suitably spaced and provided with the guideways 12 12, of the wire 7, wound in the frame in layers, and the spacing-blocks 11, made of insulating material and set in the guideways 12 and interposed between the layers of wire for supporting and spacing the wire, substantially as and for the purpose set forth.

8. The combination, with the resistance-box, of a ceiling block or fixture comprising a casing or shell 16, in which the resistance-box is seated and secured, and a hook 17, extending through the casing and secured to the resistance-box and provided with a nut 19, formed with an attaching hook 20, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand and affixed my seal, this 5th day of March, 1891, in the presence of the two subscribing witnesses.

ALOYS WIRSCHING. [L. S.]

Witnesses:

ANDREW J. PROVOST,
WILLIS FOWLER.