

No. 890,858.

PATENTED JUNE 16, 1908.

W. S. HADAWAY, JR.  
ELECTRIC HEATING DEVICE.  
APPLICATION FILED SEPT. 26, 1907.

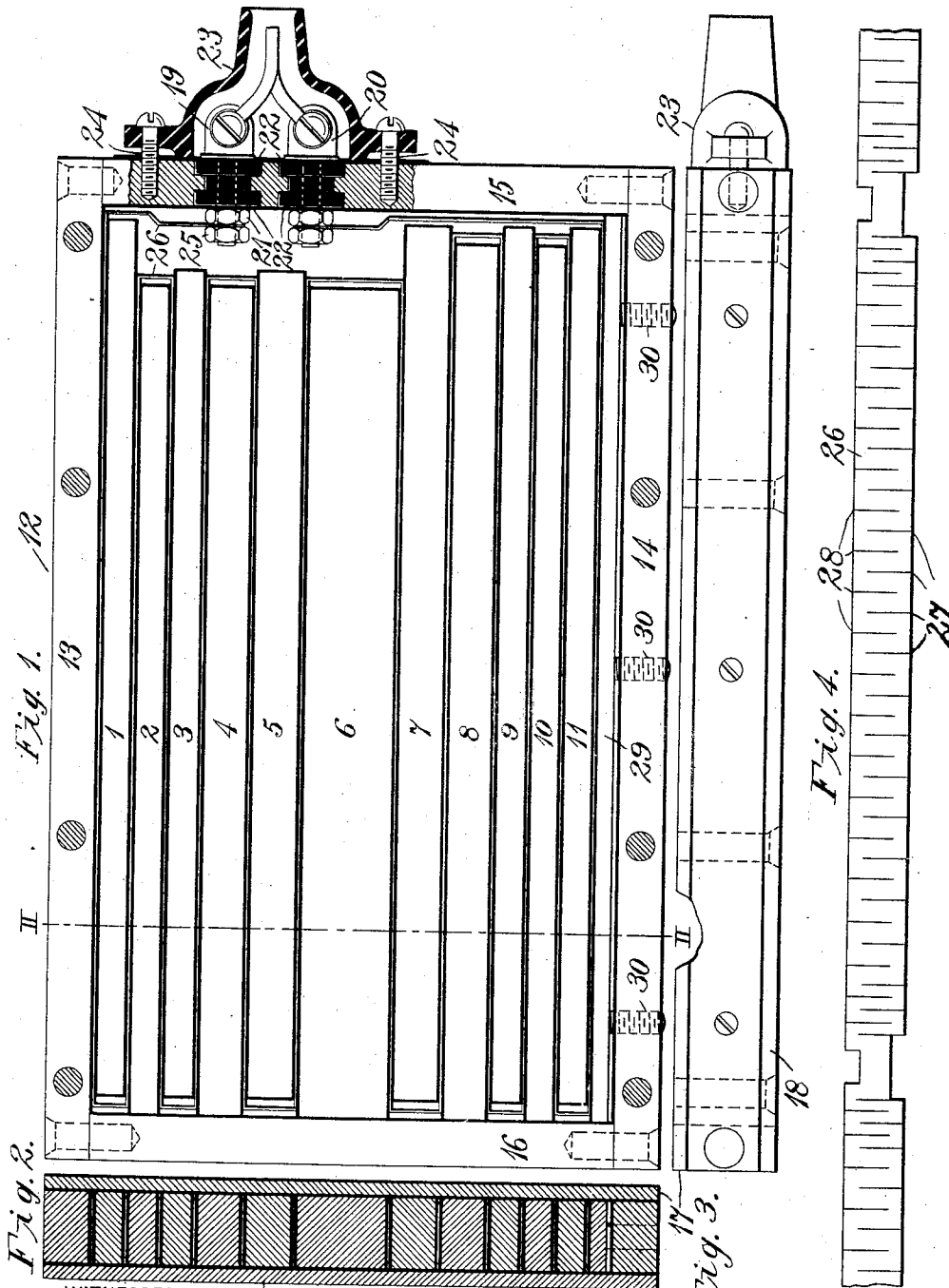


Fig. 1. 12

II

Fig. 2.

Fig. 4.

Fig. 3.

WITNESSES:

Frederic Miller  
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# UNITED STATES PATENT OFFICE.

WILLIAM S. HADAWAY, JR., OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO HADAWAY ELECTRIC HEATING & ENGINEERING COMPANY, A CORPORATION OF NEW YORK.

## ELECTRIC HEATING DEVICE.

No. 890,858.

Specification of Letters Patent.

Patented June 16, 1908.

Application filed September 26, 1907. Serial No. 394,745.

*To all whom it may concern:*

Be it known that I, WILLIAM S. HADAWAY, Jr., a citizen of the United States, and a resident of East Orange, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Electric Heating Devices, of which the following is a specification.

My invention relates to electric heating devices, and it has for its object to provide devices of this character which are adapted for use with embossing presses and other similar mechanisms where they are subjected to heavy pressure and shock.

The heating device of my present invention comprises a plurality of rods of heat-conducting material which are assembled side by side and are provided with electrical resistance units by which they are raised to the desired temperature.

The construction is very compact and rigid and the assembled heater may be used in connection with stamping and embossing press machinery, and may form the working surfaces for matrix drying presses. The heater may also be used as a stove for heating small tools such as are used by finishers and bookbinders and for various other purposes. I have gained a considerable advantage over the devices used in the prior art for similar purposes by insuring a uniform distribution of heat over the heating surface, and by specially constructing the heater, with a view to mechanical strength and durability.

Figure 1 of the accompanying drawings is a plan view, with the cover removed, of a device constructed in accordance with my invention. Fig. 2 is a sectional elevation on line II—II of Fig. 1, and Fig. 3 is a side elevation of the same. Fig. 4 is a detail view of a portion of the resistance employed in the heater disclosed in the other figures.

Referring to the drawings, the device here illustrated comprises a plurality of rods 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11 which are of substantially the same thickness and are assembled side by side in a flat box or frame 12, which comprises side strips 13 and 14, end strips 15 and 16 and cover plates 17 and 18. The rods are of different widths, the narrower rods being located nearer the side strips 13 and 14 and the widest rod being located in the center.

Terminal members 19 and 20 are secured to and are insulated from the end strip 15 by

binding nuts 21 and insulating washers 22. The outer extremities of the terminals are protected by a sheath 23 that is secured to the end strips by screws 24. The inner extremities of the terminals are screw-threaded and are provided with nuts 25 by means of which the ends of a resistance strip 26 may be electrically connected to the terminal members. The resistance strip, a section of which is illustrated in Fig. 4, is constructed of steel or other suitable material and is provided with a plurality of slots 27 and 28 which extend inwardly from opposite edges of the strip and are arranged alternately so that a zigzag current-conducting path is provided.

As above indicated, one end of the strip is connected to one terminal of the heater and from this terminal the strip extends between the rod 1 and the side strip 13 to the other end of the frame, thence back between the rods 1 and 2, then away from the terminal end between the rods 2 and 3, and so on until some part of it is disposed between each two adjacent rods and its free end is then connected to the other terminal of the device.

The strip is insulated from the bars by mica or other suitable insulating material which is not injured by relatively high temperatures, and in order that the ends of the rods may be maintained at substantially the same temperature as their middle portions, without destroying the insulating strip at the corners where relatively sharp bends are made, the slots 27 and 28 are made closer together in those portions of the strip which come close to the ends of the rods and the slots are omitted entirely at those portions of the strip in which the bends occur. It may be desirable to reduce the width of the strip at these points to some extent, as indicated in Fig. 4.

By making the middle rods of the heater materially wider than those nearer the outer edges, the temperature of the heating surfaces formed by the cover plates 17 and 18 is substantially uniform, since those parts which are farthest removed from the center of the mass are provided with the greater amounts of heating surface per unit volume. The rods 1 to 11 are held in position in the frame formed by the parts 13, 14, 15 and 16 by means of a clamping rod 29 which is interposed between the assembled rods and the side strip 14 and which is engaged by a plurality of clamping screws 30 which extend

through tapped holes in the side strip 14. In some cases it may be desirable to omit the plates 17 and 18 entirely or one of them, and when this is done the resistance strip may preferably be sunk into suitable slots which may be provided in the ends of the heating rod in order that they may be suitably protected from injury.

I desire that variations in the size and in the arrangement of details which do not depart from the spirit of my invention shall be included within its scope, and that only such limitations shall be imposed as are indicated in the appended claims.

I claim as my invention:

1. A heating device comprising a plurality of rods of different widths assembled side by side, and means located between the rods for imparting heat thereto.
2. A heating device comprising a plurality of rods of substantially uniform thickness and of different widths assembled side by side with the wider rods nearest the middle, and means located between the rods for imparting heat thereto.
3. An electric heating device comprising a plurality of rods disposed side by side, and a resistance strip which extends back and forth between the rods and is insulated from them.
4. An electric heating device comprising a

relatively flat frame or box of heat-conducting material, a plurality of rods of substantially uniform thickness assembled side by side between the cover plates of the box, and a strip of resistance material threaded back and forth between the rods and insulated from the box and from the rods.

5. An electric heating device comprising a box or frame having cover plates of heat-conducting material, and terminal members secured to one end, a plurality of rods of substantially uniform thickness and of different widths disposed within the box between the cover plates, the wider rods being located near the center of the box, and a strip of resistance material slotted to provide a zigzag path for electric current, the ends of the strip being secured to the terminals of the device and the body of the strip being threaded through the spaces formed between the rods and insulated from the rods and from the box.

In testimony whereof, I have hereunto subscribed my name this 12th day of September, 1907.

WILLIAM S. HADAWAY, JR.

Witnesses:

HAROLD B. TAYLOR,

GRANT FREEMAN.