(No Model.) 2 Sheets—Sheet 1.

J. F. KESTER.

ELECTRIC HEATER.

No. 524,062. Patented Aug. 7, 1894.

Fig. 1.

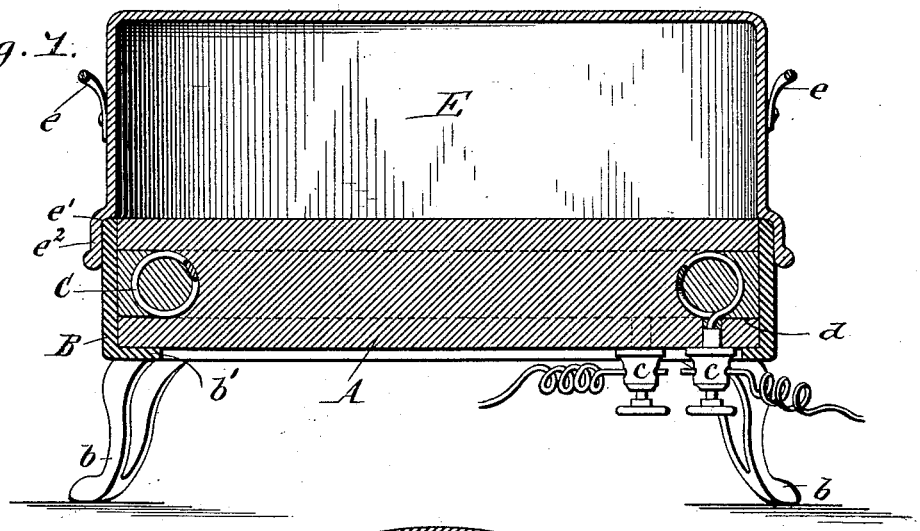


Fig. 2.

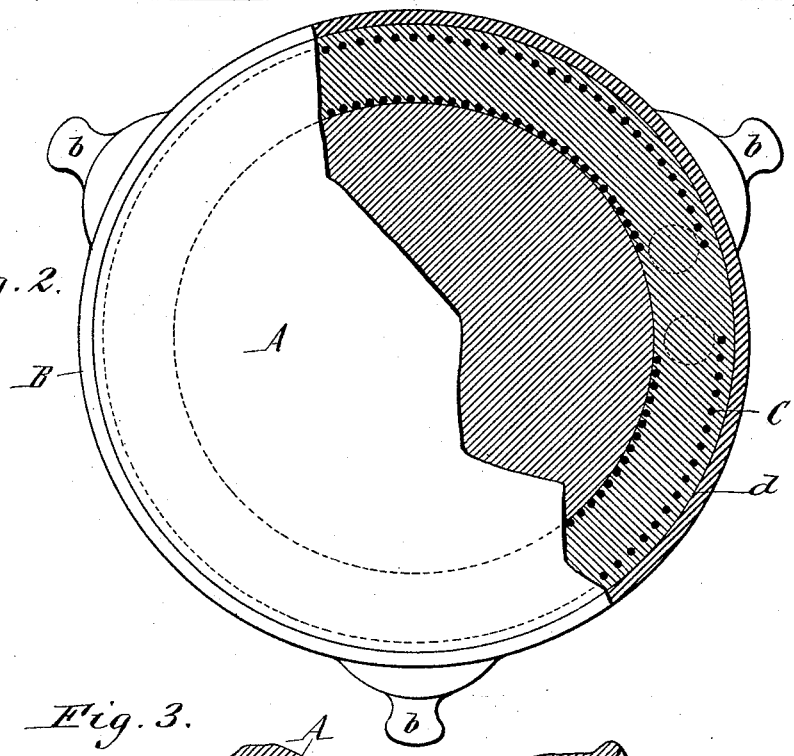
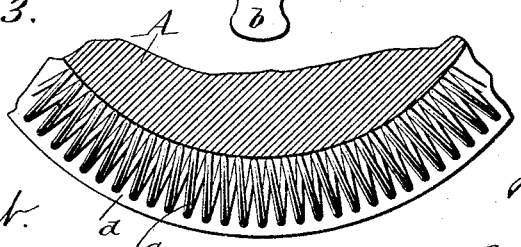


Fig. 3.



Witnesses:
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Theo. L. Popp.

Jesse F. Kester
Inventor.
By Wilhelm & Bonner. Attorneys

(No Model.) 2 Sheets—Sheet 2.

J. F. KESTER.

ELECTRIC HEATER.

No. 524,062. Patented Aug. 7, 1894.

Fig. 4.

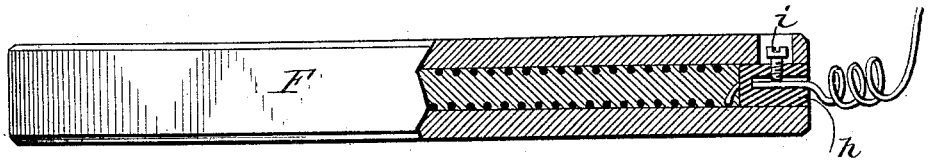


Fig. 5.

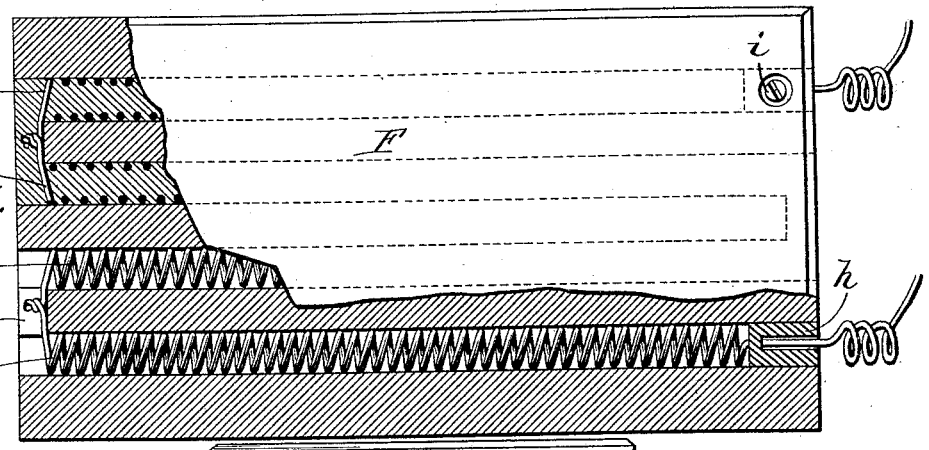


Fig. 6.

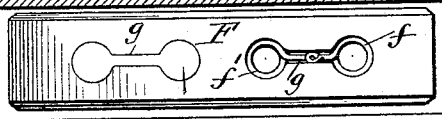


Fig. 7.

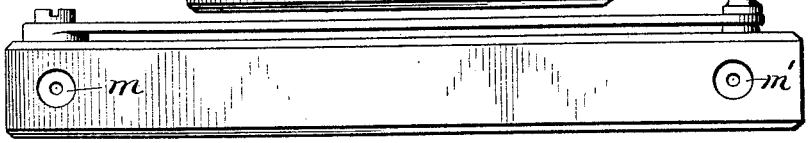
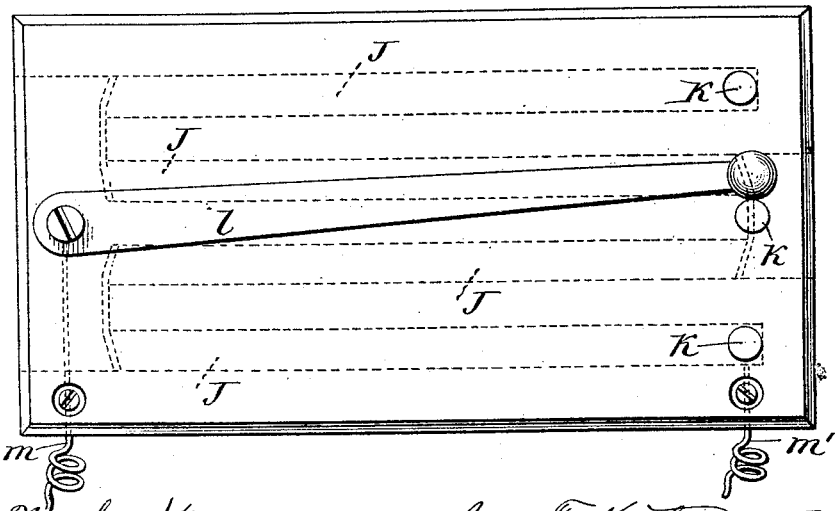


Fig. 8.



Witnesses.
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Theo. L. Popp.

Inventor
Jesse F. Kester
By Wilhelm Bonner
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UNITED STATES PATENT OFFICE.

JESSE F. KESTER, OF LA GRANGE, ILLINOIS, ASSIGNOR TO THE F. P. LITTLE ELECTRICAL CONSTRUCTION AND SUPPLY COMPANY, OF BUFFALO, NEW YORK.

ELECTRIC HEATER.

SPECIFICATION forming part of Letters Patent No. 524,062, dated August 7, 1894.

Application filed April 29, 1893. Serial No. 472,326. (No model.)

To all whom it may concern:

Be it known that I, JESSE F. KESTER, a citizen of the United States, residing at La Grange, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Electric Heaters, of which the following is a specification.

This invention relates more particularly to an improvement in electric heaters which consists essentially of coils or some other resistance medium arranged in a bed of insulating material and through which an electric current is passed, but the invention is also applicable to rheostats.

The object of my invention is to produce an inexpensive, efficient and durable heater of this class.

In the accompanying drawings consisting of two sheets:—Figure 1 is a sectional elevation of an electric heater embodying my invention. Fig. 2 is a top plan view thereof, partly in section. Fig. 3 is a fragmentary horizontal section thereof, showing the coil cavity before the same is filled. Fig. 4 is a side elevation, partly in section, of a modified construction of the heater. Fig. 5 is a top plan view of the same partly in section. Fig. 6 is an end view of the heating plate. Fig. 7 is a side elevation of a rheostat containing my invention. Fig. 8 is a top plan view thereof.

Like letters of reference refer to like parts in the several figures.

Referring to the heater shown in Figs. 1, 2 and 3, A represents a circular heating slab or disk, consisting of suitable stone, or stone-like material, preferably soapstone or slate, and supported in a circular frame B. This frame is provided with legs *b* and is formed with an inwardly extending annular flange *b'* upon which the heating slab rests.

C represents a circular heating coil embedded in the marginal portion of the heating slab and having its ends connected respectively with binding posts or terminals *c c*, preferably arranged on the under side of the slab. This coil is embedded in an annular groove *d* formed in the peripheral edge or face of the slab. This groove is cut, or otherwise formed, in the peripheral face of the slab to such a depth, that the coil, when placed therein, is counter-sunk below or arranged inwardly from the peripheral face of the slab, as clearly shown in Fig. 1. The coil is then placed in the groove and the space in the groove unoccupied by the coil, is filled with a suitable insulating substance, so as to completely inclose the coil and fill the groove, thereby holding the coil securely in place and preventing the air from coming in contact with the coil. For this purpose I prefer a filler, paste or cement whose principal or body ingredient consists of the material cut from the heating slab in forming the coil cavity. This filler may be prepared in the following manner:—Twenty-five parts of pulverized soapstone and twenty-five parts of pulverized flint glass are first mixed with fifteen parts of carbonate of soda and ten parts of boracic acid, and are melted in a crucible, after which the mixture is allowed to cool, producing a solid mass. This mass is next pulverized and mixed with twenty-five parts of silicate of soda in liquid form, whereby a pasty mass is produced, which forms the filler. The vacant portions of the coil groove are closely filled with this filler to the edge of the slab and the filler is then allowed to dry or set, or its drying is hastened by baking the slab in an appropriate oven. By employing a filler composed principally of the same material as the heating slab, the latter, when completed, presents the appearance of a solid slab without joints or crevices, and as the expansion of the filler is substantially equal to that of the slab, the filler is preserved intact, and cracking and the consequent admission of air to the coil are avoided. The heating slab fits snugly in the frame or band B, on which it is supported.

While the heating slab may be constructed of any suitable stone or stone-like material, I prefer to construct it of soapstone, because of its density, high expansive qualities and its comparative softness which permits the coil cavities to be easily cut or drilled therein.

The openings in which the shanks of the binding posts are secured are also preferably hermetically sealed with a suitable cement.

E is a removable cover placed over the

heating slab and having handles *e* for manipulating it. This cover is provided near its outer end with an internal annular shoulder *e'* by which it rests upon the upper edge of the frame B, and below said shoulder with a rim e^2 which overlaps the frame. This cover forms a kind of oven above the heating slab and retains the heat.

In the modified construction of the heater shown in Figs. 4, 5 and 6, my invention is shown in connection with a rectangular heating slab F. In this case a number of straight, connected coils $f f' f^2 f^3$, are employed, instead of a single circular coil, the coils being arranged in longitudinal apertures or cavities extending through the slab and sealed at both ends. These coil apertures are formed by drilling a number of parallel holes through the heating slab from end to end thereof. The ends of these apertures are connected by grooves *g* formed in the edges or faces of the slab through which the apertures open, and these grooves may be short, so that each connects only two adjacent apertures, as shown in Fig. 6, or they may extend unbroken along the edge of the slab. The several coils are preferably separate and their adjacent ends are twisted together in the connecting grooves *g*. After thus connecting the coils, the spaces in the coil-apertures and grooves, not occupied by the coils, are filled with an insulating filler, as in the above described construction, to prevent access of air to the coils; or if preferred only the grooves and the ends of these apertures may be hermetically closed by such filler. The terminal ends of the outer coils *f* and f^3 are preferably connected with metallic plugs *h* inserted in the adjacent ends of their apertures, as shown in Fig. 4. The conducting wires are clamped in these plugs by set screws *i*, the heads of which are preferably countersunk.

In Figs. 7 and 8 is shown a rheostat having an insulating slab constructed in accordance with my invention. The coils J are arranged lengthwise in apertures formed in the slab, as in the rectangular heater just described, and each coil is provided with a contact point *k*. *l* is the contact lever which is designed to make contact with any one of the the coil contacts. *m m'* are the usual instrument terminals of the rheostat. The unoccupied spaces of the coil apertures are filled and sealed in the same manner as those of the heating slabs hereinbefore described.

The heater represented in Figs. 1, 2 and 3, is especially desirable for baking cakes, bread, pies, &c., as the arrangement of the coil at the margin of the slab, avoids burning the cakes in the center.

In the drawings coils are shown for heating the slab, but any other suitable resistance medium, such as graphite or carbon sticks, may be employed, if desired.

I claim as my invention—

A heater, consisting of a slab of soapstone provided with a cavity, a resistance medium arranged in said cavity and an insulating filler composed of twenty-five parts of soapstone, twenty-five parts of flint glass, fifteen parts of carbonate of soda, ten parts of boracic acid and twenty-five parts of silicate of soda, substantially as set forth.

Witness my hand this 26th day of April, 1893.

JESSE F. KESTER.

Witnesses:
JNO. J. BONNER,
FRED. C. GEYER.