(No Model.) 3 Sheets—Sheet 1.

J. V. CAPEK.

ELECTRICALLY HEATED VESSEL.

No. 493,422. Patented Mar. 14, 1893.

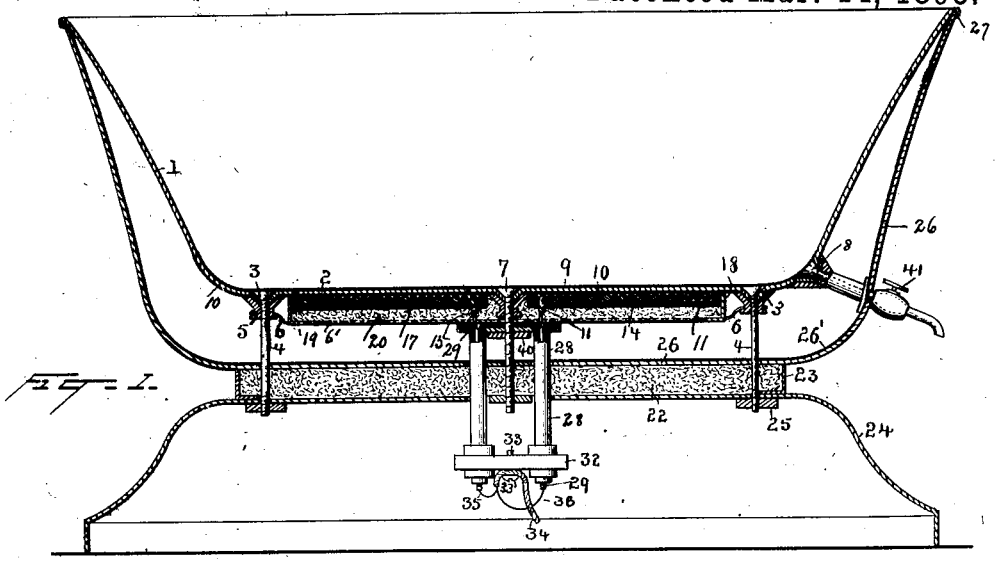

Fig. 1.

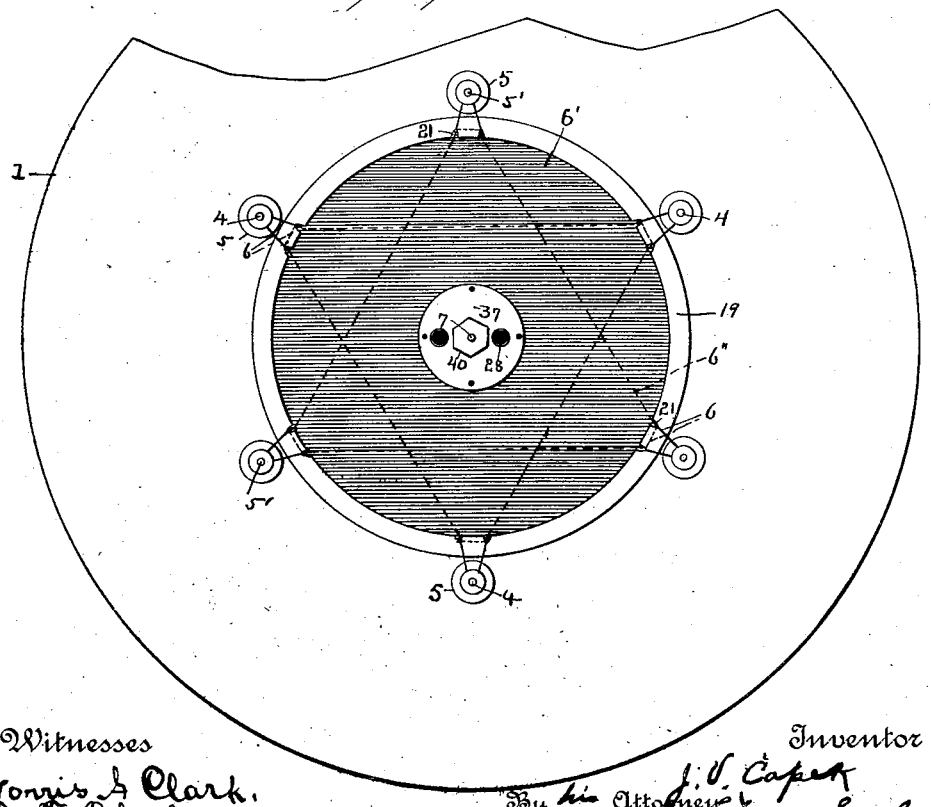

Fig. 2.

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Fig. 3.

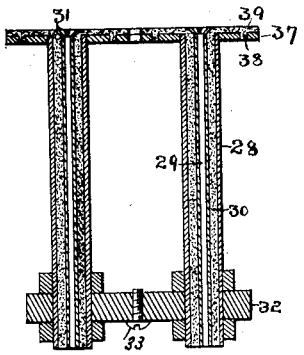


Fig. 4.

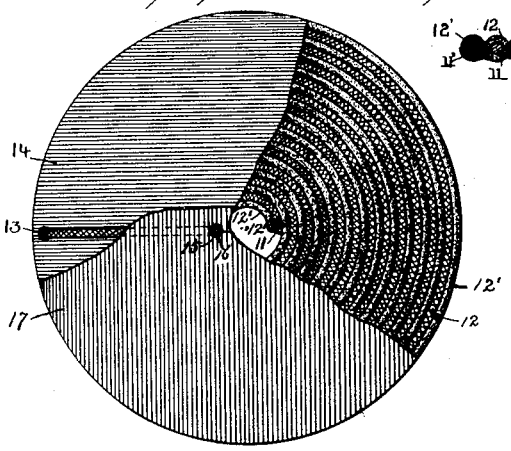


Fig. 4a.

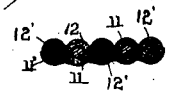


Fig. 5.

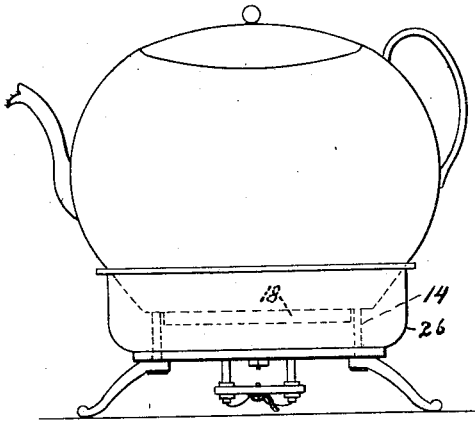


Fig. 6.

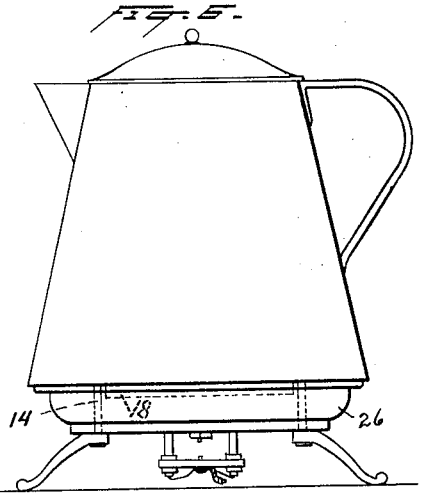
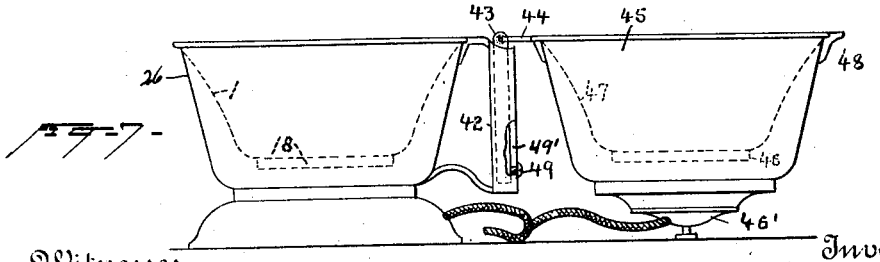


Fig. 7.



Witnesses
Norris A. Clark.
M. F. Oberly

Inventor
J. V. Capek
By his Attorneys
Dyer & Seely

(No Model.) 3 Sheets—Sheet 3.

J. V. CAPEK.

ELECTRICALLY HEATED VESSEL.

No. 493,422. Patented Mar. 14, 1893.

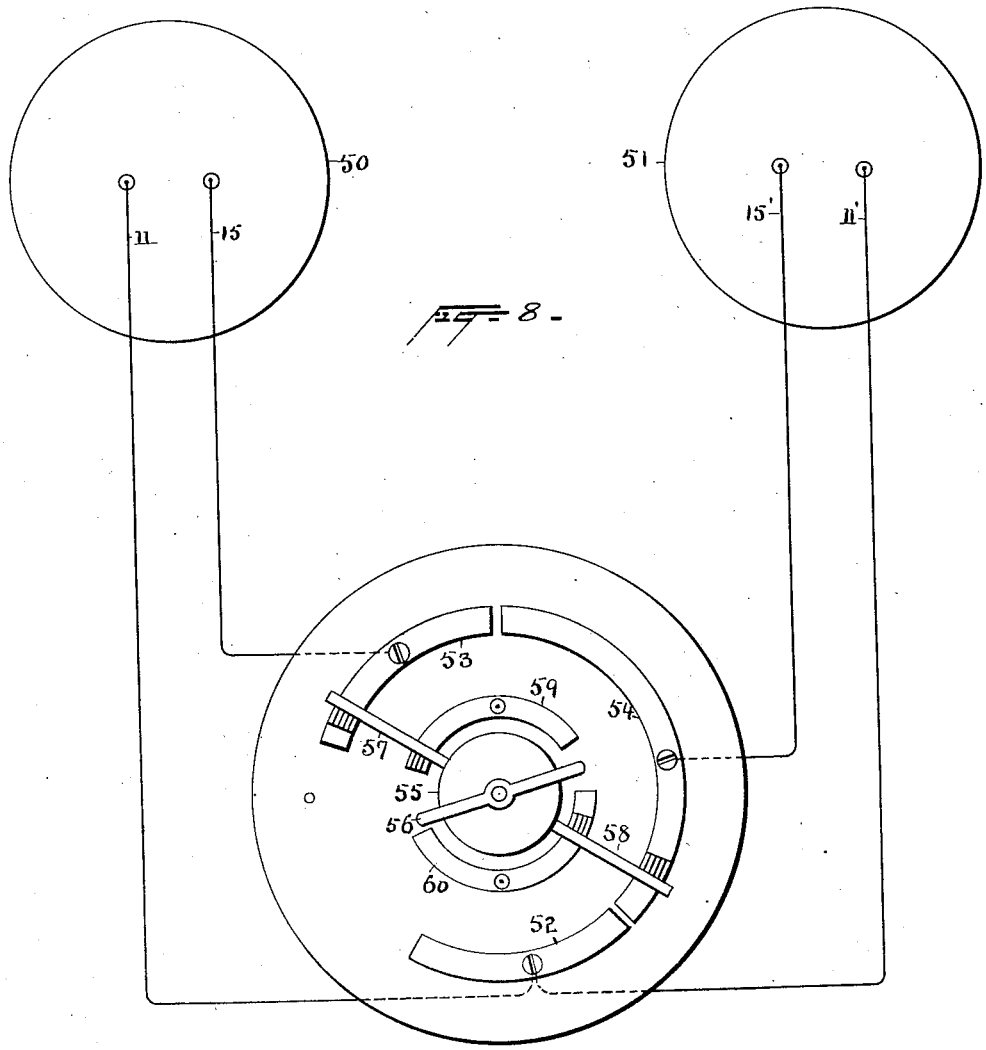


Fig. 8.

Witnesses
Norris A. Clark.
[illegible]

Inventor
By his Attorney
J. V. Capek
Dyer & Seely

UNITED STATES PATENT OFFICE.

JOHN V. CAPEK, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO EDWARD H. JOHNSON, OF SAME PLACE.

ELECTRICALLY-HEATED VESSEL.

SPECIFICATION forming part of Letters Patent No. 493,422, dated March 14, 1893.

Application filed December 14, 1891. Serial No. 414,909. (No model.)

To all whom it may concern:

Be it known that I, JOHN V. CAPEK, a citizen of the United States, residing at New York city, in the county and State of New York, have invented a certain new and useful Improvement in Electrical Cooking Utensils, of which the following is a specification.

The present invention relates to devices for cooking, in which electrical heating coils are employed. I term the present heater a direct heater or cooker, since it is preferably employed without an oven, the thing to be cooked being placed directly in the vessel constituting the body of the apparatus, or being placed in a separate vessel which can be set on or into the first mentioned vessel.

The invention consists in the several combinations and features of construction hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a central section of my apparatus. Fig. 2 is a bottom view of the vessel on which the heater proper is mounted. Fig. 3 is a view, on a larger scale than in Fig. 1, of the support for the conductors leading to the heater. Fig. 4 is a view looking from the under side of the heating coil or volute, a part of the insulating coatings being broken away to show the arrangement of the conductor. Fig. 4ª is a cross section showing the insulation of the heating conductor. Figs. 5 and 6 show the heaters mounted on different forms of receptacles. Fig. 7 shows a form of vessel in which two heaters may be mounted; and Fig. 8 is a diagrammatic view of the circuits and switch connections when two heaters are employed, for example with the utensil shown in Fig. 7.

I take a thin metal receptacle 1, preferably having a flat bottom 2 which serves as the heating plate, and form therein conical seats 3, into which screws 4, with conical heads, are inserted, a tubular nut 5, with flaring head, being preferably placed in the position shown around each screw. Some of the screws are long, as shown in Fig. 1. These are indicated by the numerals 4 in Fig. 2. In addition to the long screws I prefer to use two or more shorter screws 5′ for the purpose of giving additional supports for the lacing wire 6, hereinafter described. The short screws will be just like the long ones, except that they will terminate at the lower end of the sleeves 5. At the center of the bottom 2 is a screw 7 similar to the screws 4. In the bottom, or in one side near the bottom, is a hollow screw 8 forming a passage to the faucet, the head of which is secured in the inner vessel in the same manner as the screws already described. When these parts have been put in position the vessel is coated with enamel, preferably on the inner and outer faces, as shown by the heavy black lines at 9, 10. The enamel on the inside covers the screw heads and makes the joints tight so that if desired water can be heated directly in vessel 1. The enamel on the outside forms a layer of insulation against which the heating coil rests directly. The enamel is adapted to withstand a high degree of heat; it also stiffens the thin bottom so that it is less liable to be bent out of shape. Said heating coil consists of an iron, German silver or other heating conductor 11, insulated by a coating 12 of cotton fiber soaked or wet with silicate of sodium, and coated or treated with clay digested in silicate of sodium (11′) on the side from which the ends of the conductor project, said wire being coiled with an asbestus twine 12′, also wet in a solution of silicate of sodium or similar insulating and heat-resisting composition.

In forming the heating coil, the wire and the twine are preferably wound together between two parallel disks which serve to hold the convolutions of the volute in a single plane. When the material with which this insulating coating of the conductor and the twine are treated hardens by drying, the coil is removed from between the disks and will retain its shape. The inner end of the heating conductor is bent at right-angles, as indicated in Figs. 1 and 4. The outer end of the conductor is brought through a hole 13 in the prepared asbestus disk 14, which is placed directly on one face of the coil, and is carried along to a point near the center, and is there bent at a right-angle as indicated at 15, this end projecting through a hole 16 in the prepared asbestus disk 17, placed over the first mentioned layer.

In putting the parts together, I lay the prepared heating coil directly on the outer enameled surface of the bottom 2, the coil be-

ing made to stick thereon by a thin layer of silicate of sodium. The metal ring 18 having a flange 19, is then placed around the coil and against the bottom as shown in Fig. 1, and is secured in place by wires 6 passing around the sleeves 5 and around tongues formed by notches 21 in the flange. Asbestus fiber wet with silicate of sodium (20) is then packed within the ring and on the coil until the ring is full, and the ends of the heating coil only are visible. If desired to further connect the heater and surrounding parts to the plate 2 lacing wires 6'' may be used, these wires passing around the sleeves 5 and across asbestus body 20. Over the lacing is placed asbestus paper 6'. The "connector" or device to which the supply wires are connected is held directly against this surface by the screw 7 and nut 40. The connector consists of two tubes 28, centrally within which are smaller conducting tubes 29, separated from each other by the outer tubes by asbestus or other proper insulation 30. The inner tubes are split and slightly spread at their upper ends, as shown at 31, Fig. 3. At the upper end of the tubes is a plate 37 having small holes or indentations 38. The upper face of this plate is covered with a layer of prepared asbestus 39, which also extends into the holes 38 and makes a firm union between the plate and the asbestus. The ends of the heating coil extend into the split ends of the central tubes and form a tight fit.

22 is a plate of prepared and hardened asbestus held in the flanged metal ring 23 which rests directly on the hollow base 24. The screws 4 and 7 pass through this plate and through the base 24 and are secured by nuts 25. Above the plate 22 is a vessel 26 somewhat larger than 1 but being nearly the same diameter at its top, and when the parts are put together said top fits into the groove 27 formed by bending over the upper edge of the vessel 1 and the tubes 28 extend through holes in the base as shown in Fig. 1. It will be clear that with this construction an air space is provided between the inner and outer vessels, and the tightening of nuts 25 securely locks these two vessels together.

The vessel 26 is provided with a lining 23' of asbestus or other poor conductor of heat. On the lower ends of the tubes is placed a cross-piece 32, of wood, fiber or other suitable material, for strengthening the tubes and for supporting the screw 33 which holds the cord 34 in which are the two wires 35, 36 which conduct current from the source of current to the heating conductor. These wires are secured, by soldering or otherwise, to the lower end of the tubes 29. The hollow rivet or screw 8, which extends through the inner and outer vessel, is provided with a valve 41, by means of which liquid in the vessel can be withdrawn. The outer part of the cock screws onto the part 8 after the vessels 1 and 26 are secured together.

As already indicated, the substance to be cooked can be placed directly in the vessel 1 since it has a smooth water tight surface, but if preferred, separate cooking vessels may be set on vessel 1, or other forms of vessels may be substituted for vessel 1, as indicated in Fig. 5, where the kettle shown extends into the outer heater vessel 26. The heater, indicated by the rectangle 18 being mounted directly on the bottom of the kettle, and the kettle being secured to the base by screws 4 as described in connection with Fig. 1. In Fig. 6 a flat bottomed coffee-pot rests directly on the top of the outer vessel, and carries the heater.

I prefer in some cases to support my heaters as illustrated in Fig. 7, in which the part at the left may be made as already described in connection with Fig. 1. At one side of this part is a socket 42, in which is a sliding rod 43 forming one member of a hinge. To 43 is pivoted the second member, 44, of the hinge, this member being secured to a cover 45, which preferably incloses a second heater indicated by the dotted rectangle 46, which is the same as ring 18 of Fig. 1, it being held in place by the inner vessel 47, which corresponds to vessel 1 of Fig. 1, and which is secured to the body of the cover. The cap 46' is shown as of a different form from the base of the other section, but it may be of the same form. This cover is provided with an insulating handle 48. When in the position shown, the two heaters can be used independently, but when the cover is moved to its closed position, the substance being cooked can be placed between the two heaters, thereby being inclosed and receiving more intense heat. When the article to be cooked is too large to be held entirely within the two sections of the heater, the rod 43 can be raised, the screw 49 sliding along in a slot 49' provided for it, so as to increase the distance between the two heating coils.

In Fig. 8 two heaters are indicated by the circles 50, 51 and the wires leading therefrom are indicated by 11, 15 and 11', 15'. The wires 11, 11' are connected to the arc 52, the wire 15 to the arc 53, and 15' to the arc 54. At the center of said arcs is an insulating spindle 55, having a handle 56 and carrying two switch arms 57, 58. The positive and negative terminals of the supply circuit are connected to the two arcs 59, 60. With the switch in the position shown, the two heaters will be in series and the current passing through them will be weak. When the switch is moved so as to bring 58 onto 52, only one heater will be in circuit. When the switch is moved a little farther so that the upper contact device will bridge the space between contact plates 53, 54, the two heaters will be in multiple arc. By throwing both heaters in series on first closing the circuit, a too sudden rise of temperature is avoided. If iron wire is used, this is important, as it will enable the iron wire to

be heated up, thereby raising its resistance, before a strong current is passed through it.

What I claim is—

1. A heating wire in the form of a flat volute, and an insulating twine interposed between the successive turns of the wire, substantially as described.

2. A heating wire in the form of a flat volute, and an asbestus twine interposed between the successive turns of wire, substantially as described.

3. The combination, in an electrical heating coil, of a fiber insulated heating conductor, and a cord, the insulation and the cord, or either, being impregnated with a hardening material, the cord lying between the convolutions of the conductor, substantially as described.

4. A conductor for electrical heaters having an insulating coating of fiber soaked with silicate of sodium and covered or treated with clay and silicate of sodium, substantially as described.

5. The combination, in a heater, of the receptacle 1 the bottom of which forms the heating plate, the screws passing through the same, the enamel or coating for said receptacle and screw-heads, thereby forming a tight joint around each screw-head and a heating coil on the bottom of the heating plate, substantially as described.

6. The combination of the heating plate 2, the heating conductor therefor, the insulating layer 20, the tubes 28 and conductors carried thereby, said conductors being adapted to receive the ends of the heating coil, substantially as described.

7. The combination of the heating plate 2, the heating coil therefor, the insulating layer 20, the tubes 28 and conductors carried thereby, said conductors being adapted to receive the ends of the heating coil, and means for securing the tubes and the heating plate together, substantially as described.

8. The combination, in a heater, of a heating plate, a heating coil against the plate, a ring resting against the same side of said plate, said ring carrying insulation, and means for securing said ring and inclosed parts to the heating plate, substantially as described.

9. The combination of the heating plate, the screws extending through the same but sealed water tight, the heating coil resting against said plate, the ring and the insulating layer around and over said coil, and means for holding the same against the heating plate, substantially as described.

10. The combination, in a heating apparatus, of two sections, each containing heating coils, said sections being hinged together by means of an adjustable hinge, whereby the distance between them when the cover is in its closed position can be varied, substantially as described.

11. The combination of several heaters, each containing a heating coil, of a switch for controlling the circuit of said coils, said switch having contacts connected to the supply circuit and to the heating conductors, and a switch arm, the parts being so arranged that the two heaters will first be thrown into circuit in series, then one heater will be thrown in circuit alone, and then the heaters will be thrown in multiple arc, substantially as described.

12. The combination, of the heating vessel or plate, devices projecting therefrom, a ring having a notched flange and resting against said vessel or plate, and wires extending around said devices and around the tongues formed by the notches in the flange for securing the ring in place, and an insulated heating coil within the ring, substantially as described.

13. The combination of the heating vessel or plate, the heating coil, the insulation over the coil, the connecting device to which the heating conductor connects, and the screw securing said conductor to the face of the insulation, substantially as described.

This specification signed and witnesse 7th day of December, 1891.

JOHN V. CAPEK.

Witnesses:
CHARLES M. CATLIN,
E. A. MACCLEAN.