

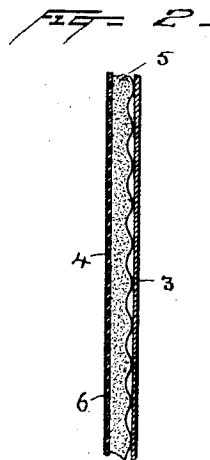
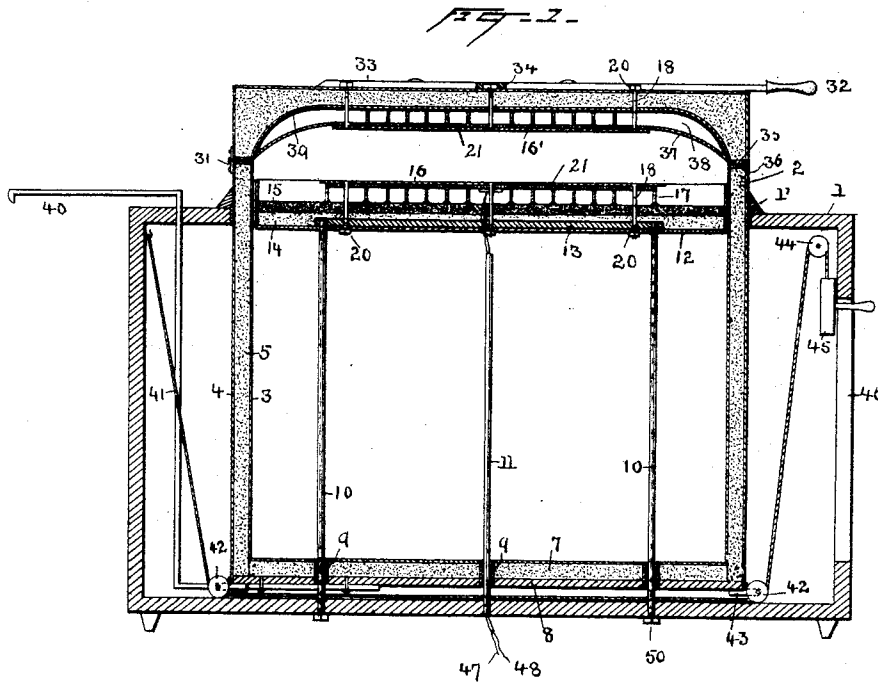
(No Model.)

2 Sheets—Sheet 1.

J. V. CAPEK.
ELECTRIC OVEN.

No. 470,419.

Patented Mar. 8, 1892.



Witnesses

Thomas A. Clark,
W. F. Oberlin

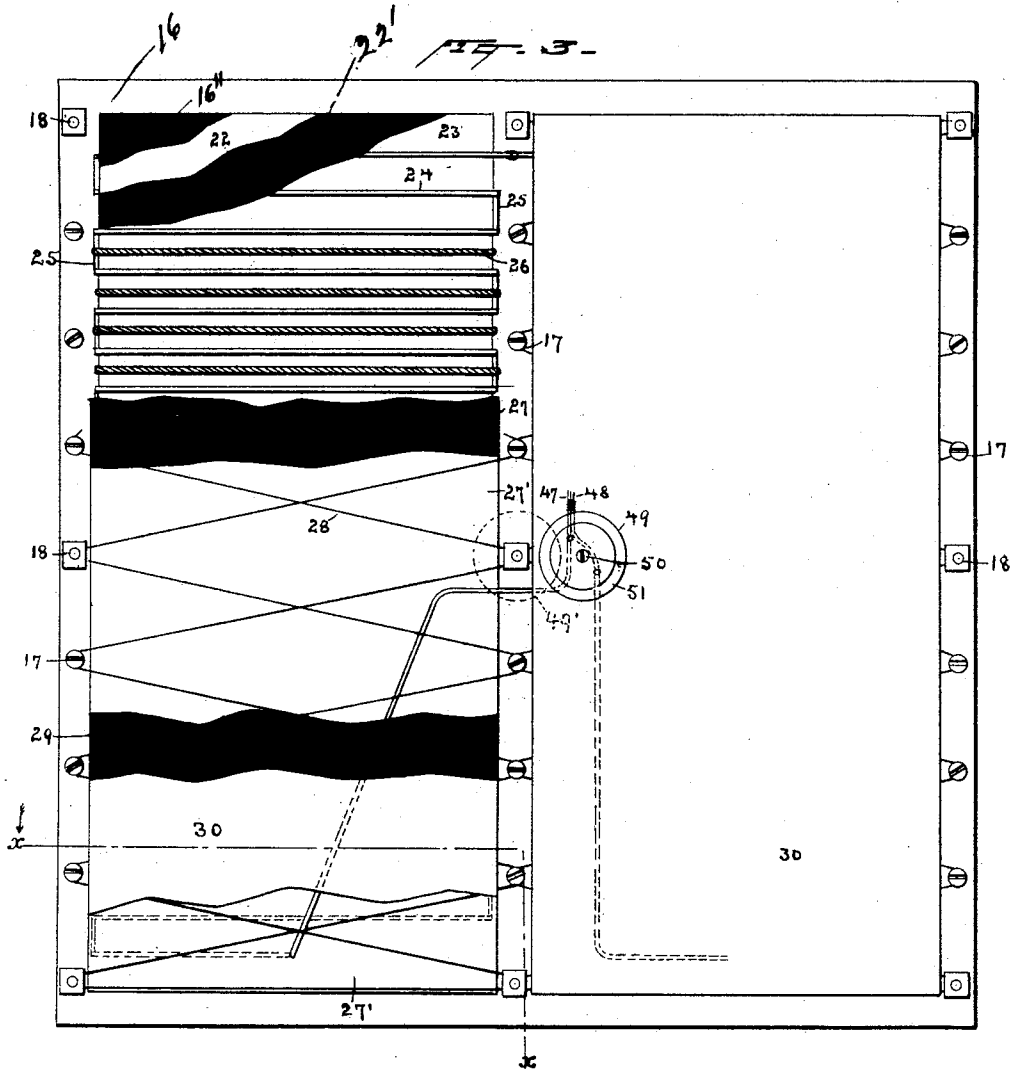
Inventor

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

J. V. CAPEK.
ELECTRIC OVEN.

No. 470,419.

Patented Mar. 8, 1892.



Witnesses
Irron L. Clark.
W. F. Oberlin

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

UNITED STATES PATENT OFFICE.

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

ELECTRIC OVEN.

SPECIFICATION forming part of Letters Patent No. 470,419, dated March 8, 1892.

Application filed August 14, 1891. Serial No. 402,602. (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 Improvements in Electric Stoves, of which the following is a specification.

The present invention relates to stoves or heaters employing electricity as the heating medium.

The main object of the invention is to provide a heater of convenient and economical arrangement in which the several parts may be varied in position or arrangement in accordance with the requirements of the user.

The improvement is illustrated in the accompanying drawings, in which—

Figure 1 is a central section of a stove. Fig. 2 is a detail of one of the walls of the oven. Fig. 3 is a face view of one of the heaters, parts being broken away in order to show the interior construction of said heater; and Fig. 4 is a sectional view of the heater on line *xx* of Fig. 3, looking in the direction of the arrow, and on an enlarged scale.

Referring first to Fig. 1, 1 is a wooden or other suitable inclosing box or case, which may be round, square, or other shape in cross-section. The top of this box is cut away at the center to admit the oven 2. Around the opening is a metal ring 1', corresponding in shape to that of the oven and forming a guide for it. This oven also may be round, square, or other shape in cross-section. The oven consists of an inner sheet-metal wall 3, a similar outer wall 4, and an intermediate filling 5 of asbestos or other poor conductor of heat. This asbestos is preferably, before being placed between the walls, wet in water or in a thin solution of sulphate of alumina and molded by slight pressure, so that the asbestos sheet will have a corrugated or rough side, and this is so inserted that the corrugated or rough side will come next to the inner wall of the oven, as indicated in Fig. 2. This arrangement forms air-spaces, thereby increasing the efficiency of the insulation and at the same time effecting a saving in the quantity of asbestos employed. The outer wall of the oven is provided with numerous perforations 6, and is covered with an insulating varnish

or paint to reduce its heat-radiating capacity. The outer sheet-metal wall of the oven does not extend over the bottom of the oven. When asbestos sheets or other material have been inserted between the side walls of the oven and a similar filling 7 has been placed over the inner wall of the oven at the bottom, a wooden bottom 8 is put in place and secured by means of screws passing through the outer shell.

9 are small metal tubes or bushings extending through the bottom and forming guards for the tubes or rods 10 11. The tubes or rods 10 support the pan-shaped hearth 12. This hearth consists of the inclosing pan, the grate 13 on the bottom thereof, a layer 14 of asbestos fiber digested in sulphate of alumina, and over this a layer 15 of the same composition, with the addition of clay, which on drying forms a very hard concrete. Through this holes are made for the wires leading to the heater and other holes for supporting screws.

On the hearth is mounted a heater having a metal heating-plate 16, having several short screws or pins 17 and long screws 18, riveted or otherwise secured to it and extending from it, as shown in Fig. 1. One end of the short screws rests against the hard insulating-concrete 15, while the long screws, which are preferably placed at the ends and centers of each row, pass entirely through the hearth and are secured by nuts 20. By this method of supporting the heater it is securely held in both directions, so that it cannot well become warped under the effect of changes in temperature, weights placed upon it, &c. These screws are preferably arranged in parallel rows at some distance apart, as shown in Fig. 3.

Between the rows of screws the electrical heaters are mounted. A heater is merely indicated in Fig. 1 at 21, the construction of the heater being more fully shown in Fig. 3. I first paint the heating-plate 16, as indicated at 16'', with a paint prepared with dilute sulphate of alumina and clay, to which may be admixed ashes of coal or asbestos—that is, calcined and pulverized asbestos. Over this paint is placed a sheet of asbestos 22, and this is again painted with the paint above de-

scribed, as indicated at 22'. On this surface are mounted the heating-strips, which are made up as follows: On a strip of asbestos 23, soaked in sulphate of alumina, pressed and dried, is wound in a zigzag line on one side only a heating wire or strip 24, this being bent over the edge of the plate, as indicated at 25, to hold it in place. These bends may or may not extend around under the plate. A thin asbestos twine 26 is then wound entirely around the asbestos plate and the heating-conductor and extending between each turn of the heating-conductor, so as to keep said turns from touching and so as to hold the conductor in place. A coating of paint 27 and a thin sheet of asbestos 27' is then placed over the conductor and twine and the heater placed on the prepared heating-plate. If desired, another painted strip of asbestos may be placed over the one last described. When the heater is thus put in place, I form a lacing 28 of cord or wire back and forth between the screws and over the heater to secure the latter to the heating-plate. The threads of the screws will prevent the lacing slipping down. Over the lacing is a coating 29 of paint, and over this a finishing-strip 30 of asbestos. The construction described gives a solid heater with small bulk and weight, and is so mounted that it will communicate heat directly to the heating-plate 16, and, since it is supported freely above the hearth, will radiate heat from its lower side, and thus aid in quickly heating the oven. The heater carried by the cover of the oven may be constructed in the same manner as the heater just described. The position of this heater is indicated at 21', immediately above the heating-plate 16', which plate is supported on the cover in the same manner that the other heating-plate is supported on the hearth. The cover is hinged to the oven at 31 and is provided with an insulating-handle 32, carried by the arm 33, which extends wholly or partially across the top of the cover and which is preferably provided with an arm 34, extending at right angles to the arm 33, and serving to strengthen the cover.

35 36 are metal rings occupying the space between the inner and outer walls of the cover and oven respectively, and when the cover is closed, fitting snugly together. Around the upper heater I provide a sheet-metal ring 37, preferably supported by the edge of the heating-plate 16'. This is to prevent rising steam from causing damage to the upper heater, which, by means of this ring, is inclosed in the chamber 38, and to form an inclosed air-chamber between the heater and the walls or cover. If desired, the inner wall 39 of the cover may be coated with asbestos. (Indicated by the heavy line.)

40 is a Z-shaped metal rod bolted to the bottom of the oven and passing through an opening in the top of the inclosing box.

41 is a cord connected at one end to a hook near the top of the inclosing box 1, passing

under pulleys 42, which are carried by brackets 43, connected to the bottom of the oven, and over a fixed pulley 44 to a counterbalance-weight 45, the handle of which extends through a slot 46 in the side of the box. The weight and the friction of the handle and other parts will hold the oven in any desired position. Evidently several ropes may be used side by side, if the size and shape of the oven is such as to require it, all of said ropes being controlled by a single handle.

The electrical connections may be made with the heaters in any desired manner. I prefer, however, to have two or more heaters on each heating-plate and to connect the several heating-conductors in series, leaving two free insulated conductor terminals. These terminals are led, preferably, from the center of the heater, as indicated in Fig. 1, through the central pipe 11 and are designated 47 48. I prefer to lead said free terminals along over the coating 27' and under the lacing to the center of the heating-plate to a disk 49 of hard asbestos containing three holes, one for a supporting-screw 50 and two for the terminals. A second hard disk is placed over the first and is clamped by the same screw. This firmly secures the conductors. In practice I prefer to place this device on one of the central screws, as indicated in Fig. 3 by the dotted circle 49'. In this case the extra screw 50 is unnecessary. The terminals, which are insulated preferably by spiral windings of asbestos, are passed through said openings and the ends may be secured to conductors in a flexible cord.

The oven described may be used as a closed oven with one or both of the heaters in circuit, and the size of the heating-space in the oven may be varied at will by moving the handle connected to the counterbalance-weight down in the slot 46, thereby bodily raising or lowering the oven and the top heater, while the lower heater remains stationary. If it is desired to use one or both of the heaters for frying or as an open heater, the cover may be swung on its hinges and allowed to rest on the supporting-rod 40, when both of the heaters will be exposed and in position for use.

I claim—

1. The combination of an oven which is bodily movable, a stationary electric heater therein, the walls of the oven extending by the heater, whereby the oven may be moved away from the heater to enlarge the heating-chamber without uncovering the heater, substantially as described.

2. The combination of an oven which is bodily movable, a stationary electric heater therein, the walls of the oven extending by the heater, whereby the oven may be moved away from the heater to enlarge the heating-chamber without uncovering the heater, and a second heater carried by the movable oven, substantially as described.

3. The combination of an oven which is bod-

ily movable, a heater in the same, the walls of the oven extending by the heater, whereby the oven can be moved away from the heater without uncovering it, a hinged cover or side on said oven opposite the heater, and a second heater on the inner side of said cover, substantially as described.

4. The combination of an oven having a hinged cover or side, a heater supported on the inner side thereof, said cover or side being movable to bring the heater in position to close the oven and heat it or to bring the heater in position to heat externally, substantially as described.

5. The combination of an oven having a hinged cover, a heater supported on the under side thereof, whereby when the cover is closed the heater is in position to heat the oven, and a support for the cover in position to hold it substantially horizontal when it is open, whereby the heater can be used also as an open heater, substantially as described.

6. The combination of an inclosing box or case, an oven within said box, and means for moving and holding the oven out of the box to a greater or less extent, substantially as described.

7. The combination of an inclosing box, a stationary heater supported thereby, an oven within said box and surrounding said heater, and means comprising a rope or similar device passing under the oven and over suitable pulleys for moving and holding the oven, substantially as described.

8. The combination of a stationary heater, a movable oven inclosing it, said oven being so constructed and arranged that it can be moved toward or from the heater, and in the latter case shall not uncover the heater, and means, as described, for moving the oven toward or from said heater and holding it at the desired distance from the heater, whereby a heating-space of desired size is obtained, substantially as described.

9. The combination of a stationary heater, an oven inclosing it and movable without uncovering the heater, and means for counterbalancing the oven, whereby the cover or side of the oven opposite the heater may be retained at the desired distance from the heater, substantially as described.

10. The combination of an inclosing box, an oven in the same, but movable into or out of said box, and means for counterbalancing the oven, whereby it may be retained wholly or partially raised from the box, substantially as described.

11. The combination of an inclosing box, an oven containing a heater and movable into or out of said box without uncovering the heater, and means for moving the oven, substantially as described.

12. The combination, with the inner and outer walls of an oven, of a mass of insulating material between the walls, there being

an air-space or air-spaces next to the inner wall, substantially as described.

13. The combination, with the inner and outer walls of an oven, of a corrugated or roughened mass of insulating material between them, substantially as described.

14. The combination, with the inner and outer walls of an oven, of a corrugated or roughened mass of insulating material between them, the corrugations facing the inner wall, and the outer wall being perforated and varnished, substantially as described.

15. The combination, with a support, of an electrical heater consisting of a heating-plate, metal screws or pins extending therefrom to said support, and an insulated heating conductor on the plate between the screws or pins, substantially as described.

16. The combination, with a support, of an electrical heater consisting of a heating-plate, metal screws or pins extending directly therefrom, the screws or pins being of two different lengths, the longer ones being secured to the support, while the shorter ones rest against it, and an insulating heating-conductor on the plate between the screws or pins, substantially as described.

17. The combination of a hearth or support, a heating-plate mounted thereon and held at a distance therefrom, a series of screws or pins holding the plate from warping toward the hearth, and a series of screws or pins holding the plate from warping from the hearth, substantially as described.

18. The combination, in a heater, of a pan-shaped support, a grate in the bottom thereof, a layer of insulating material over the grate, a layer of asbestos and clay, and a top plate, substantially as described.

19. The combination, in a heater, of a pan-shaped support, a grate in the bottom thereof, a layer of insulating material over the grate, a layer of asbestos and clay, a top plate, and an electrical heater, substantially as described.

20. The combination, in an electrical heater, of an insulating-plate, a heating-conductor thereon, and an insulating-cord wound around the plate and lying between the turns of the heating-conductor, substantially as described.

21. The combination, in an electrical heater, of an insulating-plate, a heating-conductor on one side thereof, and an insulating-cord wound around the plate and lying between the turns of the heating-conductor, substantially as described.

22. The combination, in an electrical heater, of an insulating-plate, a heating-conductor thereon, an insulating-cord wound around the plate and lying between the turns of the heating-conductor, and an insulating-coating over the same, substantially as described.

23. The combination, in an electrical heater, of an insulating-plate, a heating-conductor thereon, an insulating-cord wound around the

plate and lying between the turns of the heating-conductor, an insulating-coating thereon, and an insulating-sheet, substantially as described.

- 5 24. The combination of a plate, an electrical heater thereon, screws or pins projecting from the plate at intervals, and a lacing passing over the heater and around said screws or pins for securing the two together, 10 substantially as described.

- 15 25. The combination of a heating-plate, an electrical heater thereon, a lacing for securing the two together, and an insulating-coating over the lacing, substantially as described.

- 20 26. The combination of a plate, an insulating-coating thereon, an electrical heater over said coating, insulating-coating over the heater, and a lacing for securing the heater to the plate, substantially as described.

27. The combination of the plate, screws or pins extending therefrom, the electrical

heater, and the lacing-strand held by the screws or pins for securing the heater and plate together, substantially as described. 25

28. The combination, in an electrical heater, of the insulated heating-conductor, an insulating disk or plate having holes through which the conductor-terminals extend, and a disk or plate over the same and secured in 30 place, substantially as described.

29. The combination, with the inclosing wall or cover of an oven, of a heater mounted thereon and supported at a distance therefrom, and means for inclosing the space between the heater or wall, substantially as described. 35

This specification signed and witnessed this 5th day of August, 1891.

JOHN V. CAPEK.

Witnesses:

CHARLES M. CATLIN,
J. A. YOUNG.