2 Sheets—Sheet 1.

E. WHITELEY.

Cooking and Steam Heating Apparatus.

No. 40,300. Patented Oct. 13, 1863.

Fig: 6

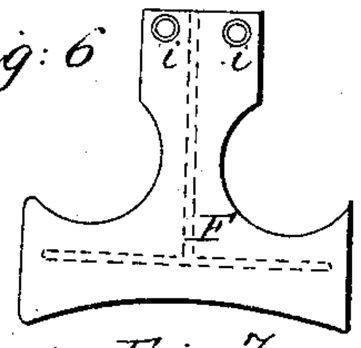


Fig: 7.

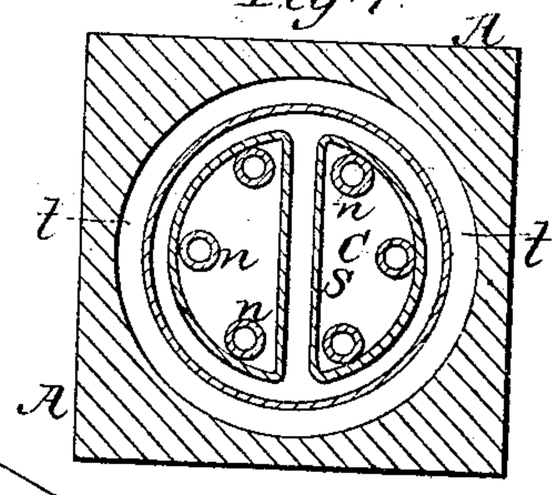


Fig: 1.

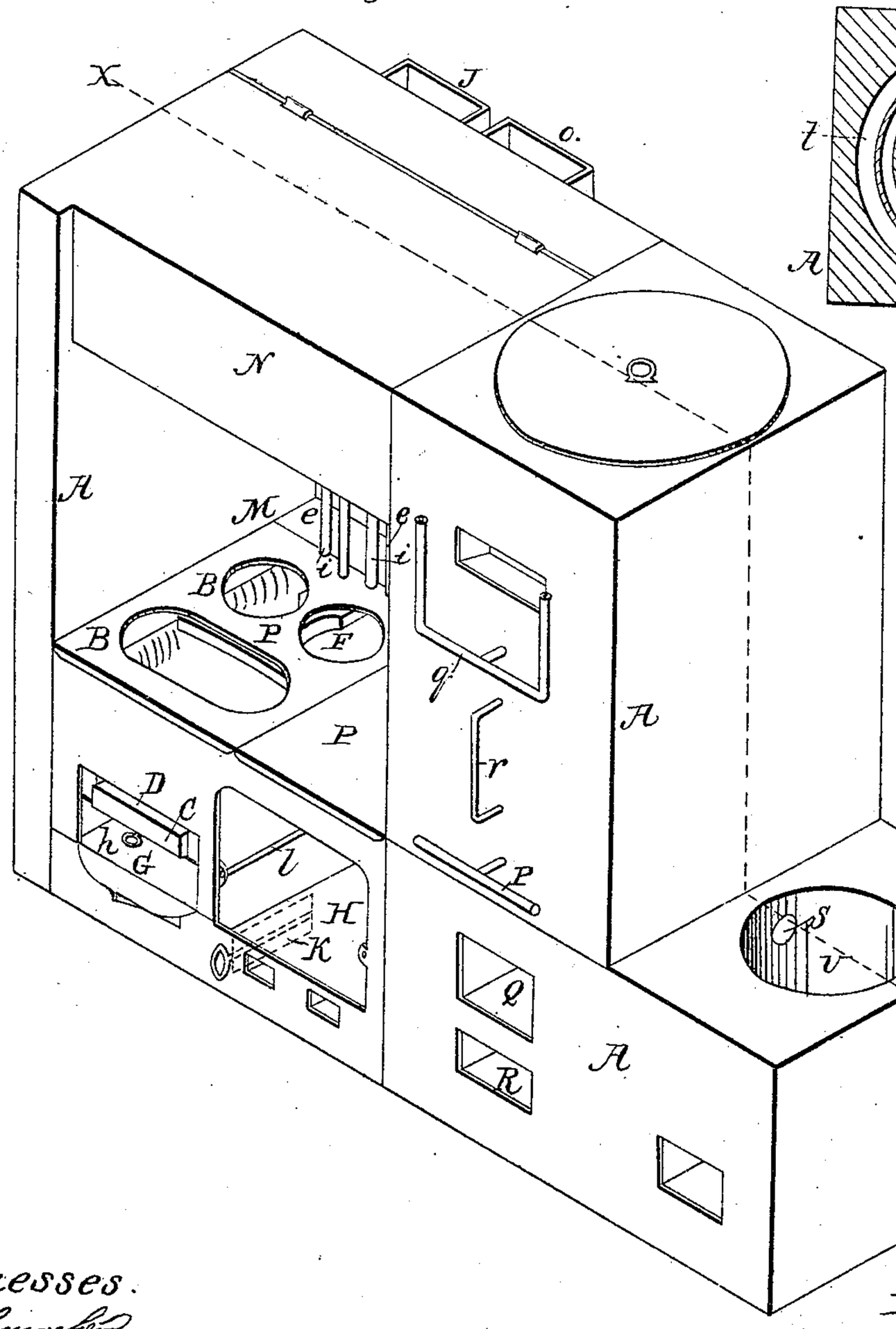
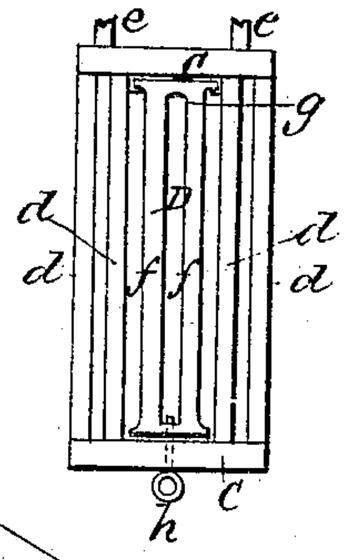


Fig: 5.



Witnesses.

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2 Sheets—Sheet 2

E. WHITELEY.

Cooking and Steam Heating Apparatus.

No. 40,300. Patented Oct. 13, 1863.

Fig: 3.

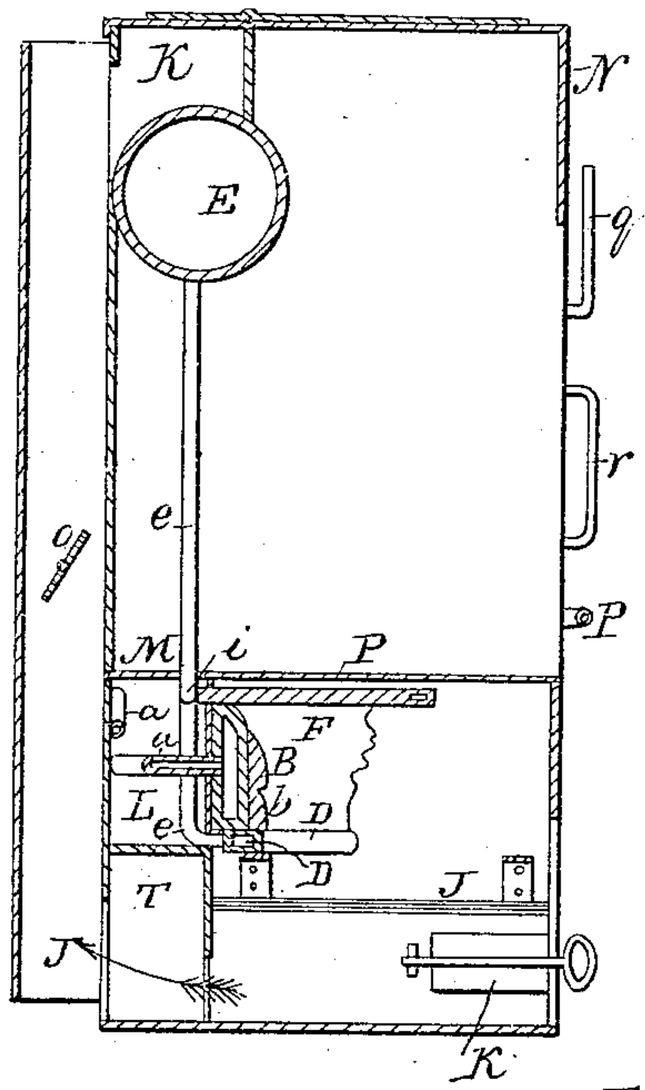


Fig: 4.

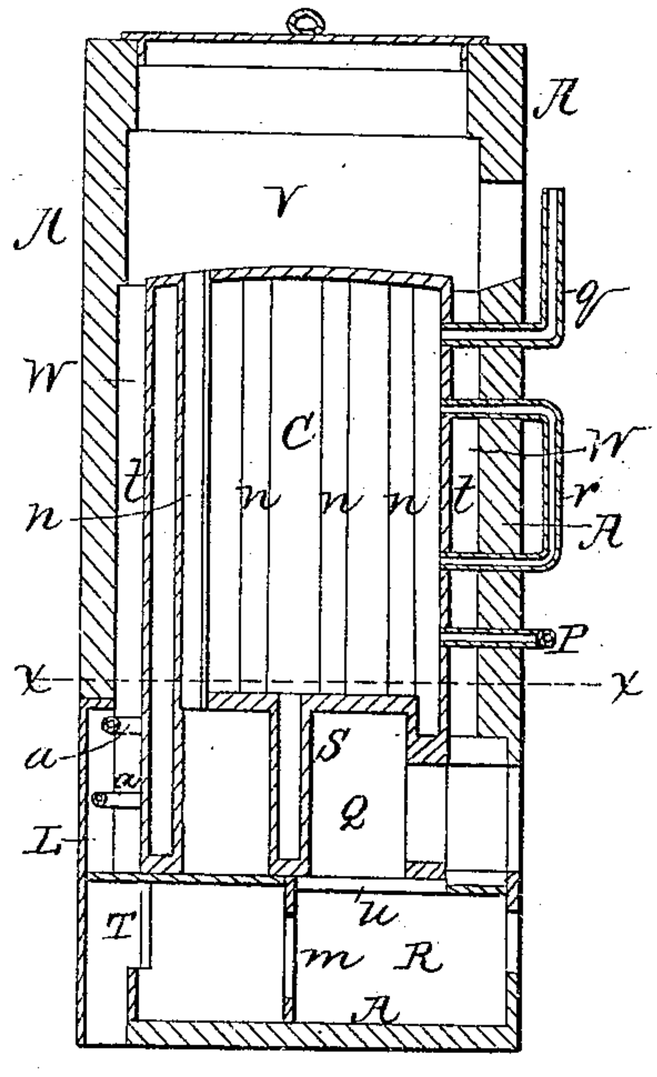
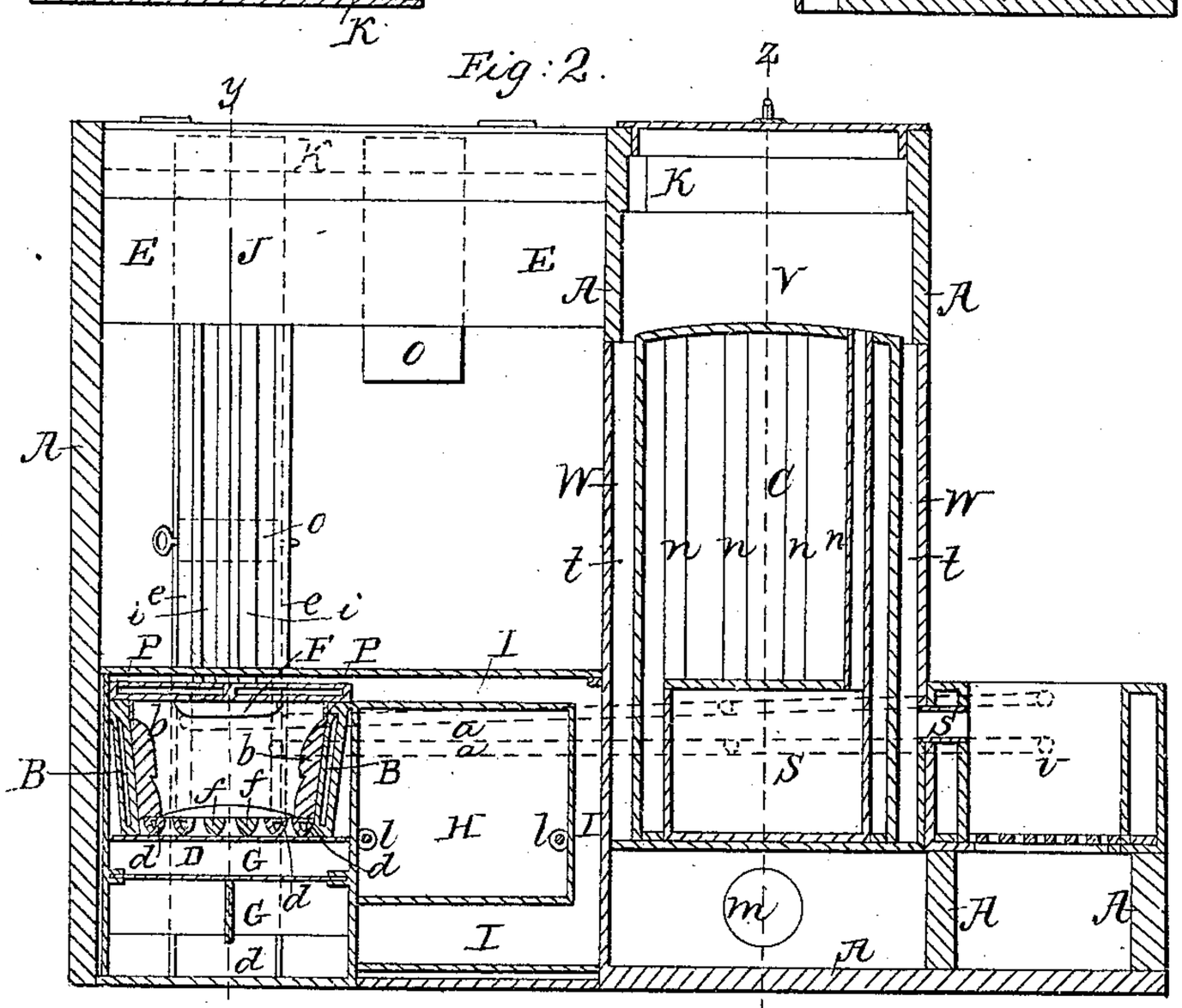


Fig: 2.



Witnesses.
P. C. Teschemacher
N. W. Stearns

Inventor
E. Whiteley

UNITED STATES PATENT OFFICE.

EDWARD WHITELEY, OF CAMBRIDGE, MASSACHUSETTS.

IMPROVEMENT IN COOKING AND STEAM-HEATING APPARATUS.

Specification forming part of Letters Patent No. **40,300**, dated October 13, 1863.

To all whom it may concern:

Be it known that I, EDWARD WHITELEY, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented an Improved Cooking Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of my improved apparatus. Fig. 2 is a vertical longitudinal section on the line *x x* of Fig. 1. Fig. 3 is a vertical section on the line *y y* of Fig. 2. Fig. 4 is a vertical section on the line *z z* of Fig. 2; Fig. 5, a plan of the water-grate; Fig. 6, a plan of the horizontal water-vessel F; Fig. 7, a section on the line X X of Fig. 4.

My invention has for its object to produce a combined apparatus for cooking, heating water, and furnishing steam for washing and other culinary purposes, by which I am enabled to perform a large amount of work and effect a material saving in space, labor, and fuel; and it consists in the employment of a hollow water-vessel resting on the fire-pot, and connected with the hot-water tank, said water-vessel being placed beneath the top plate, and not connected therewith, as heretofore, thus exposing the entire exterior surface of the water-vessel to the action of the fire, and the fire passing between the water-vessel and top plate, the top plate is heated to a greater extent as required; also, in the employment of the hollow water-vessel and hollow water-grate connected with the hot-water tank, in combination with a fire-pot surrounded by a water-space and connected with a steam-boiler, by which the cooking and heating of water for culinary purposes may be effected by one fire; also, in the employment of a horizontal hot-water tank, so placed as to be out of the way and in a convenient position for connecting it with the water-grate and hollow water-vessel beneath the top plate, and which also answers as a support for or forms one side of a flue from the steam-boiler to the chimney, and receives heat from the same; also, in the use of a partition under the steam-boiler running from the bottom of the ash-pit to the lower tube-sheet, so arranged that when a fire is employed under the boiler the flame and hot gases pass through one-half of the tubes only, that from the cooking-fire passing by a back flue through the remainder of the tubes, thus forming separate flues, the drafts in which do not interfere with each other, this partition being furnished with an aperture which is open when the fire under the boiler is not in use, thus permitting the flame, &c., from the cooking-fire to pass through all the tubes of the boiler; and my invention also consists in certain other improvements, which will be pointed out in the course of this description.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the accompanying drawings, A represents the brick-work in which the apparatus is set; B, the fire-pot, which is surrounded by a hollow water-space connected by circulating-pipes *a* with a steam-boiler, C. Within the water-space surrounding the fire-pot is a partition, constructed in a manner similar to that described in the patent granted to me on the 17th day of June, 1856. The dimensions of the fire-pot B may be contracted in summer, when a smaller fire is required, by means of an auxiliary lining, *b*, of soapstone or other suitable material, which is inserted as seen in Figs. 2 and 3.

Beneath the top plate, P, containing the pot-holes, is placed a hollow water-vessel, F, which rests on top of the fire-pot B and is connected by circulating-pipes *i* with the hot-water tank E, there being a partition through this water-vessel, as seen dotted in Fig. 6, to assist the circulation of the water. The top plate, P, is elevated a short distance above the water-vessel F, thus allowing the heat and flame to pass between them, whereby the top plate is sufficiently heated to be used for cooking or boiling upon, and with this arrangement the top plate can be removed without disconnecting the water-pipes, for the purpose of cleansing the oven-flue or for renewing the top plate, and the whole of the surface of the vessel F is exposed to the action of the fire, thus affording a greater amount of heating-surface, none of which advantages were gained when the top plate and water-vessel were cast together in one piece. The bottom of the ash-pit G is made to slide in and out in grooves made in the side pieces, thus affording convenient and easy access to the draft-regulator of the oven, and for the

purpose of cleaning out the back flues or for the purpose of renewing the bottom of the ash-pit.

H is the oven, which is heated by the flame and hot gases from the fire-pot B, which pass through the space or flue I, surrounding the oven and out at the passage *j*, and thence to the smoke-flue J. The passage *j* is commanded by a damper or draft-regulator, *k*, by which the fire is regulated as required. The damper *k* is placed near the forward part of the oven-flue for the purpose of equalizing the heat, which is always greater at the back of the oven, and by placing the damper in this position the heat is drawn toward the front part as required. The back and front plates of the oven, instead of being connected together by rivets, as heretofore, are connected together by the rods *l*, which also serve as runners or ledges for the oven-shelves.

The hot-water tank E is supported horizontally in the masonry or on brackets, and is connected, as before described, by circulating-pipes with the water-vessel F and water-grate D, by which means the water is heated as required. The tank E is also in a convenient position for connecting with the circulating-pipes, and does not take up any space which could be occupied for other purposes, which is not the case with an upright tank. It also answers as a support for or forms one side of a flue, K, connecting the flue of the steam-boiler C with the smoke-flue J, and receives heat from the same, which would otherwise pass up the chimney and be lost. It also receives heat from the radiation of the hot plates beneath it.

The circulating-pipes *a e i*, instead of passing through the brick-work, as heretofore, pass through a chamber or space, L, at the back of the apparatus, which is furnished with plates or covers M, which can be removed so as to have access to the pipes for repairs, &c.

The sheet-iron top of the apparatus is turned down at N, forming a hood, under which the heated air is drawn by the ventilating-flue O, and is retained in contact with the bottom of the hot-water tank, or may pass out through the ventilating-flue in summer, if desired, the overhanging portion N preventing the heat from escaping into the apartment.

The apparatus for furnishing steam for cooking will now be described.

C is an upright tubular boiler set in the brick-work; Q, the fire-space under the boiler; R, the ash-pit, and *u* the grate-bars.

S is a partition extending from the bottom of the ash-pit to the lower tube-sheet of the boiler, and having an aperture, *m*, through it, which may be opened or closed, for a purpose that will be presently explained. The upper portion of the partition S above the aperture *m* is made hollow, so as to admit of the circulation of water through it from the boiler C, and forms a part of the boiler, as seen in Figs. 4 and 7. Steam is raised in the boiler C (when only a moderate supply is required) by the fire in the pot B, the flame and hot gases from which pass by the back flue, T, beneath the steam-boiler C and up through the tubes *n*, the opening *m* through the partition S allowing them to pass through all the tubes of the boiler, and thence into the space or chamber V above the boiler, from which they pass by the flue K along the hot-water boiler E to the smoke-flue J, (the damper *o* in the flue J having been closed, so as to cause the flame, hot gases, &c., to take this direction.) The back flue, T, has an opening at one end furnished with a slide, so as to afford access for cleaning out the soot, &c. The water-space surrounding the fire-pot B is connected with the boiler C by the circulating-pipes *a*, as before described. When a greater supply of steam is required, the fire under the boiler C is employed, the opening *m* through the partition S having been first closed, otherwise the gases, &c., from the fire-pot B would extinguish the fire kindled under the boiler C. The flame, &c., from the fire at B now pass through only one-half of the tubes *n*, that from the fire at Q passing through the remainder, both passing out at the top of the boiler into the chamber V and through the flue K, as before described.

p is the pipe by which water is supplied to the boiler C, and *q* are the steam-pipes leading to the heating apparatus, &c.

r is a water-gage.

In case of the derangement of the fire-pot B, or in case an extra supply of steam should be required, I employ the auxiliary fire-pot U, which is surrounded by a water-space in a similar manner to the fire-pot B, and is also connected with the boiler C by circulating-pipes, (shown in red, Fig. 2.) The flame and hot gases from the fire-pot U pass by the pipe *s* into the space *t*, between the casing W and the outside of the boiler C, and thence into the chamber V and by the flue K to the chimney. The auxiliary fire-pot U may also be used for cooking in a similar manner to B. It will thus be seen that the draft from the fire-pot B passes up through one-half of the tubes *n* in the boiler C, that from the fire at Q through the balance of the tubes *n*, while that from the auxiliary fire-pot U passes up between the casing W and the exterior of the boiler, all without interfering with each other, into the chamber V and out by the flue K, which has not been effected in any apparatus with which I am acquainted. Beneath the oven-flue is an air-space *v*, which prevents the heat from being absorbed by the masonry underneath.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The fire-pots B, Q, and U, in combination with the steam-generator C and the flues T, K, and J, commanded by suitable valves or dampers, arranged and operating in the manner and for the purpose, substantially as herein described.

2. The horizontal water-vessel F, resting on the fire-pot, and not connected with the top plate, P, constructed and arranged in the manner substantially as set forth, for the purpose specified.

3. In combination with the water-vessel F, as described, the fire-pot B, surrounded by water and connected with the steam-boiler C, operating in the manner described, for the purpose set forth.

4. Placing the hot-water tank or boiler E in a horizontal position above the fire, and so as to form a support for or one side of the flue K, in the manner substantially as set forth.

5. The partition S, with its opening *m*, arranged and operating in the manner substantially as set forth, for the purpose specified.

6. Using the stay-rods *l* as runners or ledges for the oven-shelves, substantially in the manner set forth.

E. WHITELEY.

Witnesses:

P. E. TESCHEMACHER,

N. W. STEARNS.