2 Sheets—Sheet 1.

J. P. BECK.

Combined Heating Furnace and Range.

No. 199,347. Patented Jan. 22, 1878.

Fig. 1.

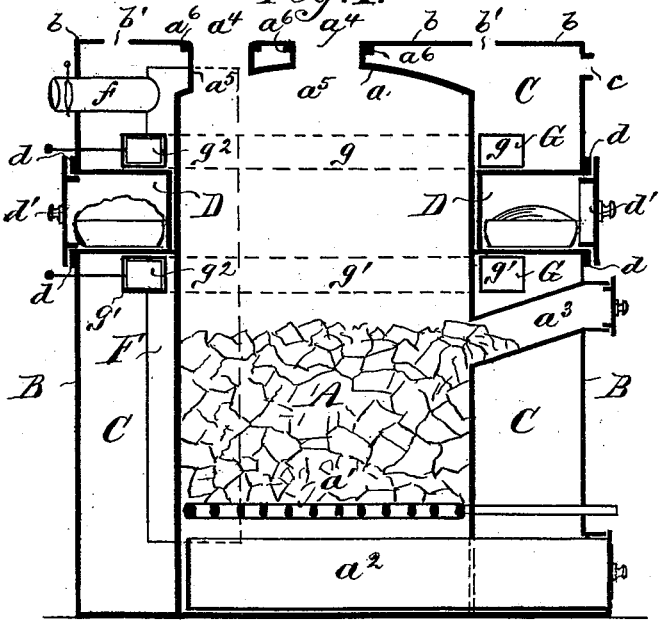


Fig. 2.

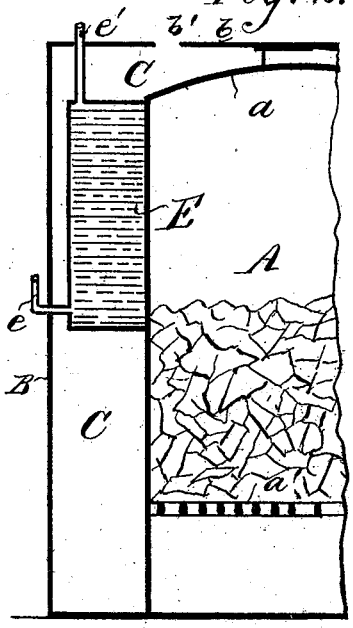


Fig. 3.

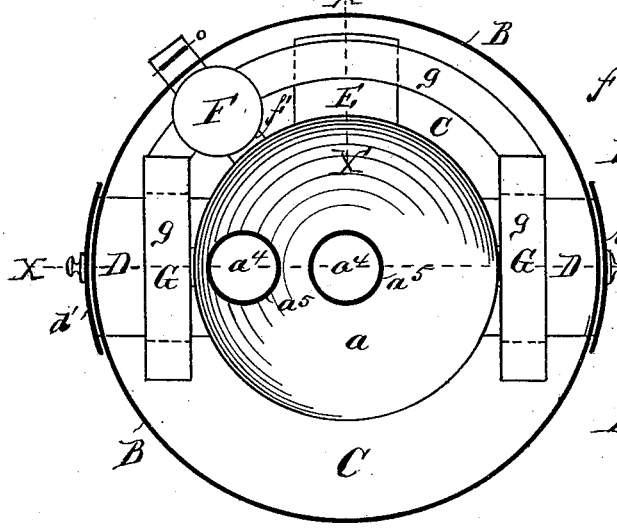
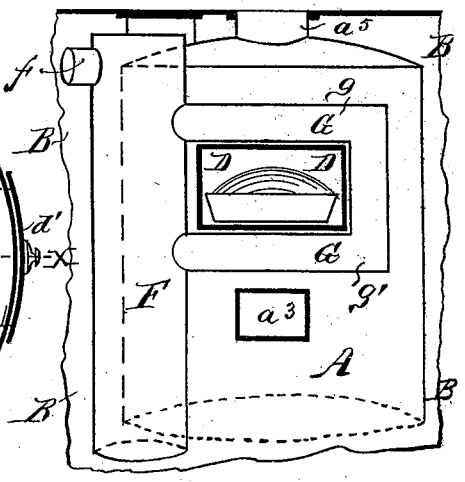


Fig. 4.



Witnesses;
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Chas. Kerthel

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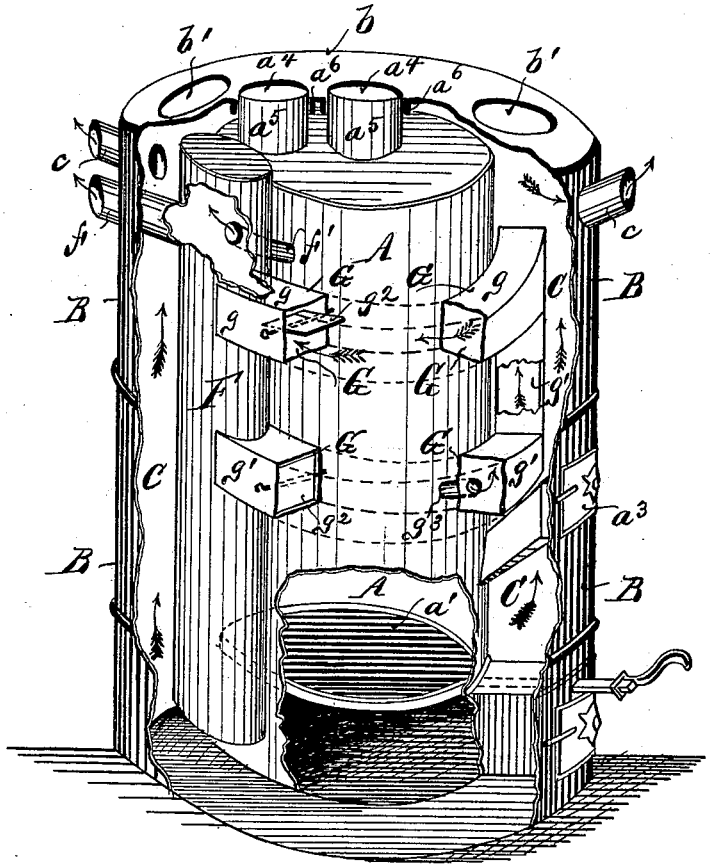
2 Sheets—Sheet 2.

J. P. BECK.

Combined Heating Furnace and Range.

No. 199,347. **Patented Jan. 22, 1878.**

Fig. 5.



Witnesses;
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UNITED STATES PATENT OFFICE.

JAMES P. BECK, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN COMBINED HEATING FURNACE AND RANGE.

Specification forming part of Letters Patent No. **199,347**, dated January 22, 1878; application filed November 20, 1877.

To all whom it may concern:

Be it known that I, JAMES P. BECK, of St. Louis, in the county of St. Louis and State of Missouri, have invented an Improved Combined Heating Furnace and Range, of which the following is a specification:

The object of this invention is to combine in one apparatus the purposes of a hot-air furnace and of a range, so that the same fire used for warming the dwelling is at the time serviceable for laundry, cooking, and baking purposes, and also as a water-heater.

This invention will first be fully described, and the novel parts thereof hereinafter pointed out in the claims.

Of the drawings, Figure 1 is a sectional elevation on line X X of Fig. 3. Fig. 2 is a sectional elevation on line X′ X′ of Fig. 3. Fig. 3 is a top plan, the top of the outside cylinder being broken away to show the interior parts. Fig. 4 is a side elevation, the exterior cylinder being broken away to show the arrangement of the side pipe passing round the oven and connecting to the large pipe or drum. Fig. 5 is a perspective sectional view, showing, chiefly, the side pipe and its connections, with parts broken away, and, by arrows, indicating the course of the products of combustion; also showing the top construction of the furnace and range, and the course taken by the hot air.

A is the inside cylinder, having the top *a*, and near the bottom being provided with a suitable grate, a^1. a^2 is the ash-pit. a^3 is the door for the furnace. B is the outside cylinder, surrounding the furnace A, and between the outside and inside cylinders is the hot-air space or chamber C. (See figures.) The hot air within the chamber C is led off by pipes *c*, throughout the house, in the usual well-known manner, for warming the rooms.

D are the ovens for baking, roasting, and laundry purposes. These ovens consist of separate castings or metal boxes, closed on all sides but their front. The front edge of the oven-chamber has a flange, *d*, to project or lap over the outside cylinder. (See Fig. 1.) The oven or ovens so constructed are located within the hot-air chamber C and against the inside cylinder, the flange *d* closing the joint between the oven and outside cylinder. The ovens so located are exposed the better to be heated from the fire in the furnace, and at the same time each oven acts as a radiator of heat within the hot-air chamber.

The fumes, smell, or gaseous matter arising from baking, roasting, &c., or from the use of the oven, cannot pass into the hot-air chamber, owing to the flange *d* closing the joint with the outside cylinder, and thus the hot air is kept from being rendered unwholesome by the use of the oven or ovens.

The front of each oven is properly controlled by a door, *d′*, hinged to the exterior cylinder or to the oven, and so as to open outwardly into the room. (See Fig. 1.) The top *b* of the exterior cylinder has holes *b′* for the insertion of pots and other kitchen utensils in the same manner as an ordinary cooking-stove. (See Figs. 1 and 5.) The top *a* of the inside cylinder has also holes a^4, for the purpose just stated. (See Figs. 1 and 3.) These holes a^4, however, are elevated so as to form the neck or short pipe a^5, (see Figs. 1, 3,) and which projects through corresponding holes in the top of the outside cylinder. The under side of the outside cylinder has annular shoulders at a^6, so as to close the joint of the holes in the top of said cylinder with the contiguous part of the necks or short pipes a^5, and thus prevent the fumes, gas, or smoke, &c., from entrance or passage into the hot-air chamber, or into the space between the tops of the two cylinders. (See Fig. 5.)

The top of the necks or short pipes a^5 is large enough to receive the pot, &c., so that same can pass down into the fire, and hence be exposed to the direct action of the heat. In the use of the holes *b′* (in the top of the outside cylinder) the pot does not reach into the fire, the heat used being more moderate.

All the purposes of an ordinary cooking-stove can be accomplished by the use of the same fire in the furnace.

E represents a reservoir for the heating of water. This reservoir consists of a cast chamber or box, properly attached to the inside cylinder, and within the hot-air chamber, so as to be entirely surrounded by the heat. (See

Figs. 2 and 3.) *e* is the delivery-pipe, leading from the reservoir to distribute the hot water to any part of the building. *e'* is the pipe to supply the water to the reservoir. The same fire in the furnace heats the reservoir.

In place of the reservoir a coil of pipes can be substituted for the same purpose.

F is the drum or large pipe, and it is arranged within the hot-air chamber in the rear of the furnace, and has its upper end connected to the smoke-pipe *f*, that leads to the chimney. The drum F also communicates, by short pipe *f'*, with the inside cylinder. (See Fig. 5.)

G represents the entire side pipe or pipes, for the purposes of conducting the flames, heat, &c., from the inside cylinder to envelop the oven or ovens, also to act as radiators of heat, as well as to carry off the smoke and other products of combustion out of the chimney. (See Figs. 1, 3, 4, and 5.)

The side pipe G can be stated to consist of the forked or communicating branches *g g'*, arranged so that one fork, *g*, passes over the top of the oven, connecting with the drum, and the remaining fork, *g'*, passes down one side and under the oven, and also connecting with the drum. (See Figs. 1, 3, 4, and 5.) Each part or branch *g g'* has a damper, *g²*. The opposite oven is provided with a like pipe, G, having the forks, parts, or branches *g g'* to pass over and under the oven, and two ends thereof connecting to the opposite side of the drum. (See Fig. 3.) The side pipe G, further, by short pipe *g³*, (see Fig. 5,) connects with the interior of the furnace proper. From the furnace A the passage of the flames, smoke, &c., is through the short pipe *g³* into the pipe part *g⁴*, in an upward direction into the pipe part *g;* from thence direct into the drum, in case the upper damper is open and the lower damper is closed. (See arrows in Fig. 5.) In case the upper damper is closed and the lower one is open, the passage of the flames, smoke, &c., will be through the pipe parts *g³ g'* into the drum. Direct communication from the furnace to the drum exists by means of the pipe *f'*, (see Fig. 5,) and from the drum the final exit for the smoke, &c., is through the chimney-pipe *c*. (See Fig. 5.)

The heat, flames, &c., circulating through the side pipes G, heat the oven or ovens; also the drum or large pipe throws off its heat, and all this action is further utilized to heat the air in the warm-air chamber.

My invention thus constructed is, therefore, a heating furnace and range combined, and in which a single fire can be utilized for various purposes of family requirements.

The warm air is not contaminated by the use of the parts constituting the range, and hence wholesome warm air is passed into the rooms. The fire in the furnace is also kept more regular and uniform in burning, it being under the control of the domestic or operator, thus insuring the distribution of warm air of proper temperature for respiration.

What I claim is—

1. The side pipe G, consisting of the communicating branches *g g'*, arranged within the hot-air chamber to surround the oven, as shown and described, and having dampers *g²*, the short pipe *g³*, in combination with the drum and furnace A, by means whereof the passage of the flames, smoke, &c., takes place from said furnace, and surrounds the oven or ovens, as and for the purposes set forth.

2. The combination of the oven or ovens D, having the flange *d*, the hot-air chamber C, the side pipe G, consisting of the connecting-branches *g g'*, arranged as shown and described, and having damper *g²*, the short pipe *g³*, the furnace A, the drum F, and cylinder B, all said parts operating as and for the purposes set forth.

3. The inside cylinder A, having its top *a* provided with short pipes *a⁵*, the exterior cylinder B, having its top *b* provided with the holes *b'*, the shoulders *a⁶*, the oven or ovens D, the water-heater E, the side pipe G, and the drum F, all said parts being arranged and constructed as and for the purposes set forth.

In testimony of said invention I have hereunto set my hand.

JAS. P. BECK.

Witnesses:

WILLIAM W. HERTHEL,

JOHN W. HERTHEL.