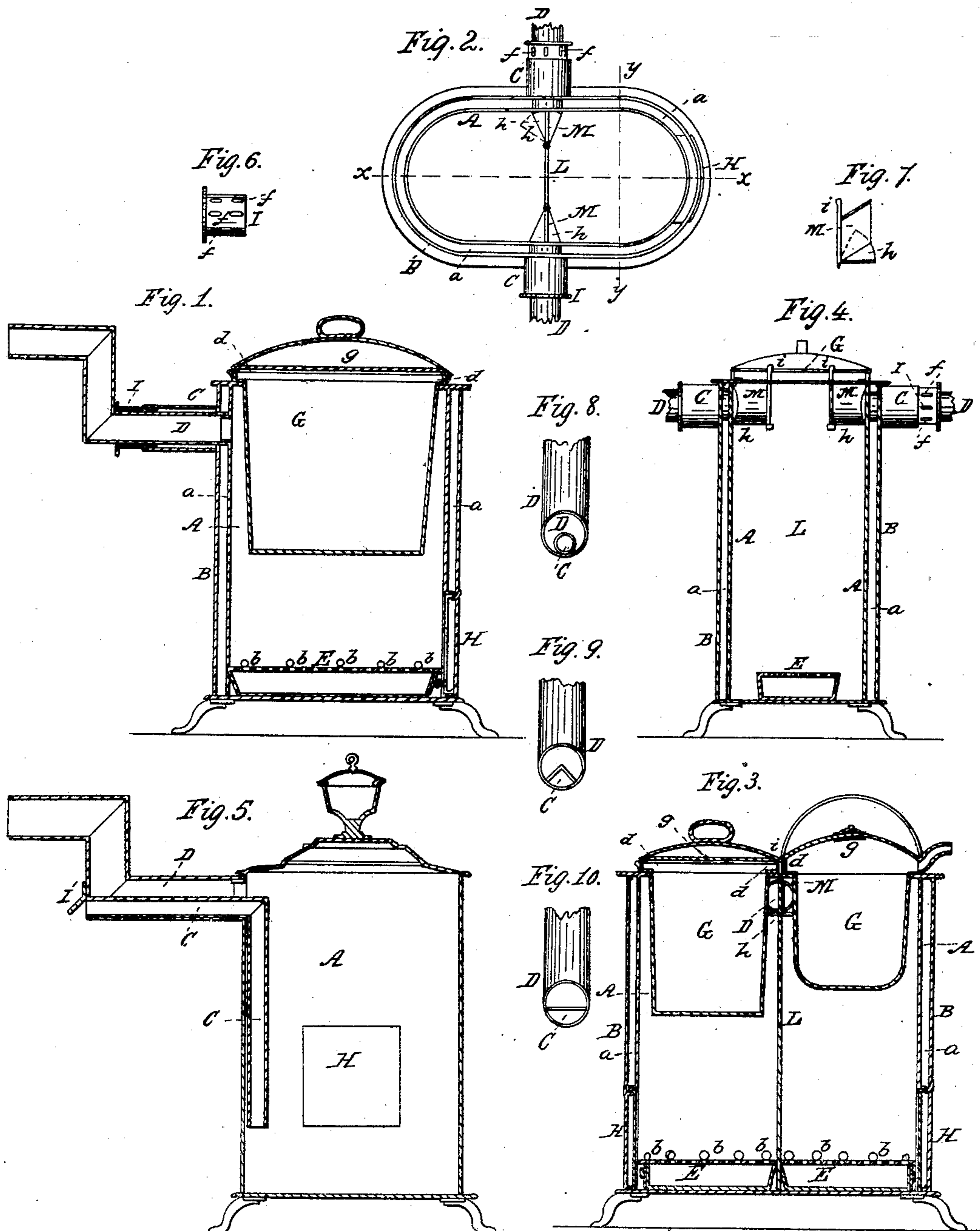


J. S. BROWN.

Stove.

No. 20,466.

Patented June 1, 1858.



UNITED STATES PATENT OFFICE.

J. S. BROWN, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO HIMSELF, AND
JOSEPH KENT, OF BALTIMORE, MARYLAND.

STOVE.

Specification of Letters Patent No. 20,466, dated June 1, 1858.

To all whom it may concern:

Be it known that I, J. S. BROWN, of Washington, in the District of Columbia, have invented a new and useful Improvement in Stoves for Boiling, Cooking, and Heating or Warming; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification, like letters designating corresponding parts in all the figures thereof.

The nature of my invention consists in utilizing a portion of the heat escaping through the smoke-pipe by heating therewith the draft of air supplied to the burning fuel, to support the combustion thereof.

The improvement may be applied to stoves and furnaces of all kinds; and the manner thereof will be understood for all cases, by considering it in the different modes hereinafter set forth.

All kinds of stoves may be arranged in two general classes, according to their purposes, viz:—those which are intended to communicate their heat to vessels and articles situated within them, as in cooking, heating water, &c.; and those which are intended to send forth their heat, by radiation and conduction, to warm the atmosphere of rooms. Some stoves are intended to combine both of these general purposes. But it will be sufficient to give examples, to show the application of the invention to both classes separately.

Figure 1, represents a central, vertical section of a stove, constructed for boiling, to which my improvement is applied. Since it is desirable to retain as much of the heat generated in the stove as possible, and communicate it solely to the boiler G, there may be an inner case A, and an outer case B, with an intermediate space *a*, between them. The smoke-pipe D, extends from the interior case A, outward through the outer case B; and outside of, or around, said smoke-pipe, a draft-pipe C, extends outward from the outer case B. Through this outer pipe all the air for supporting the combustion of the fuel in the stove, passes, and is heated to a considerably high temperature by contact with the smoke-pipe D. The heat, which is thus extracted from the smoke-pipe, would otherwise pass off, and be wasted to the desired use. The length of the draft-pipe

C, may be a foot or two, or such as may be convenient and effective.

A valve, or damper, I, is employed to regulate the amount of air admitted through the draft-pipe, or to completely close its mouth, when it is desired to stop the draft entirely. The most convenient construction of the valve is such as shown in Figs. 1, and 6. It consists of a cylinder, of sheet metal, and of the proper diameter to fit the pipe C, over or into which it slides. The outer end of the cylinder is closed by a plate having a hole through it which accurately fits around the smoke-pipe D. Through the cylinder are apertures *f, f*, through which the air only is admitted. By drawing the valve farther out, more of these apertures will be opened, and consequently more air will be admitted; and by pushing it farther in, more of these apertures will be closed by the draft-pipe C, and consequently less air will be admitted; or by pushing it entirely into or over said draft-pipe, all the apertures will be closed, and no air, by consequence, admitted. The draft air once admitted into the space *a*, will take up more or less of the heat radiated from the inner case A, and thereby save, instead of allowing it to be communicated to the outer case B, and so lost to the use of the boiler. The draft is thence admitted, through apertures *b, b*, in the inner case A, near the bottom thereof, around the grate E, to the fuel placed thereon.

The door H, fits tightly in the cases of the stove, so as to admit little or no air from the outside in that way. It may have a double thickness, inclosing a space, as shown in the figure. The boiler G, should be inserted into the stove, or as much thereof, as practicable. The portion not inserted, if any, may project outward over the top of the stove, so as to cover all the space inclosed by the inner case A, as shown at *d, d*. The cover may have a double thickness of metal, inclosing a space *g*, as shown, for the purpose of preventing, as much as practicable, the escape of heat upward through the top of the stove.

Figs. 2, 3, and 4, represent views of a stove constructed for boiling, on the same plan, as the stove shown in Fig. 1, differing principally therefrom in being arranged for two boilers. Fig. 2, is a plan thereof, the top being removed; Fig. 3, is a vertical section of the same, in the plane indicated by the

line $x x$, Fig. 2; Fig. 4, is a vertical section thereof, in the plane indicated by the line $y y$, Fig. 2. The construction is the same as in Fig. 1, duplicated in most parts; and there is, in addition, a division plate L, dividing the interior space in the middle, as represented; and a valve M, occupies a corner space left in said plate opposite to the smoke-pipe outlet, as shown. The valve is hinged on a pivot i , which extends upward through the top of the stove, whereby the valve may be moved as desired. It has a horizontal plate, or wing, h , made in the form of a sector of a circle equal in extent, to the angular distance which the valve is intended to be moved right and left, as represented in the figures mentioned, and most distinctly in Fig. 7. When the valve is placed in a central position, or in the plane of the partition L, it offers equal space for the smoke and other products of combustion, to pass from both boiler spaces of the stove, into the smoke-pipe. But if only one boiler is heating, the valve is turned aside toward the other boiler space, thereby opening the entire outlet of the smoke-pipe to the compartment in which the boiler is heating, and shutting off the other. In these figures of the drawings, a smoke-pipe and draft-pipe are represented on each side of the stove; and a valve N, before each smoke-pipe outlet. The object of this arrangement is, if desired, to connect one smoke-pipe with another stove, or an oven, while the other smoke-pipe communicates with the chimney as usual; so that the heat brought through the smoke-pipe from the other stove, may be usefully employed in heating one or both of the boilers G G. In this way, often, the water or other articles in the boilers may be heated without any additional fuel, applied immediately under them. The double valves M, M, are in that case, managed nearly as above described. If both boilers are to be heated at the same time, both valves are centrally placed; but if only one is to be heated, both valves are turned aside toward the other. Or if one boiler is to be heated faster than the other, both valves are turned aside sufficiently to supply the proper proportion of heat to each.

Instead of using boilers G, G, as above described, ovens or roasters may be substituted; so that the same arrangement may be used for baking, or roasting, as for boiling, the invention being equally as applicable to all purposes of cooking as to that described.

The above instances show the application of the invention to the first general class of stoves, viz., those in which the heat is desired to be concentrated and used within them, as for cooking, &c. Fig. 5, exhibits a central,

vertical section of a stove, intended solely for heating the surrounding atmosphere, to which the invention is applied. In this instance, double cases are not used, since it is desirable to communicate the heat immediately to the air outside. The simplest way of heating the draft air by the heat escaping through the smoke-pipe D, is to insert a smaller pipe C, therein, one end communicating with the exterior air, while the amount of draft is regulated or entirely cut off by a valve, or damper, I'. This valve should properly be made as the corresponding valve I, described above, not as shown in this figure. The inner end of the pipe may extend down into the stove nearly to the ordinary position of the burning fuel. The door H, should shut tightly, and no other means of introducing a draft should be employed. But in applying the invention to stoves already in use, it will be sufficient to keep all other apertures and doors, opening into the stove, continually shut. Thus it is applicable to all stoves which may be closed tight, and especially to those usually denominated, "air-tight stoves." When stoves are made expressly with a view of applying this improvement, the whole may be arranged as may seem most convenient and desirable. Fig. 8, exhibits a transverse section of the smoke-pipe D, and draft-pipe C.

It is obvious that, instead of having the draft-pipe within the smoke-pipe, the latter may be within the former. Or the smoke-pipe D, and draft-pipe C, may be parts of a single pipe; two modes of arranging which thus, are respectively indicated in Figs. 9, and 10.

I do not claim simply heating the draft-air before it reaches the fire chamber; nor do I claim heating the draft air by contact with a smoke passage, situated within the stove, the application of my invention being only to a smoke passage, situated outside of the stove, that is, to what is understood by the term, "smoke-pipe."

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

1. Introducing the air which supports the combustion of the fuel in the stove, through, around, or otherwise in contact with, the smoke-pipe, whereby a portion of the heat escaping through said smoke-pipe, is utilized in improving the combustion of the fuel.

2. I also claim the valve I, arranged and operating in combination with the draft-pipe C, substantially as specified.

J. S. BROWN.

Witnesses:

EDWARD P. HUDSON,
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