

(No Model.)

S. SMITH.  
OVEN.

No. 384,177.

Patented June 5, 1888.

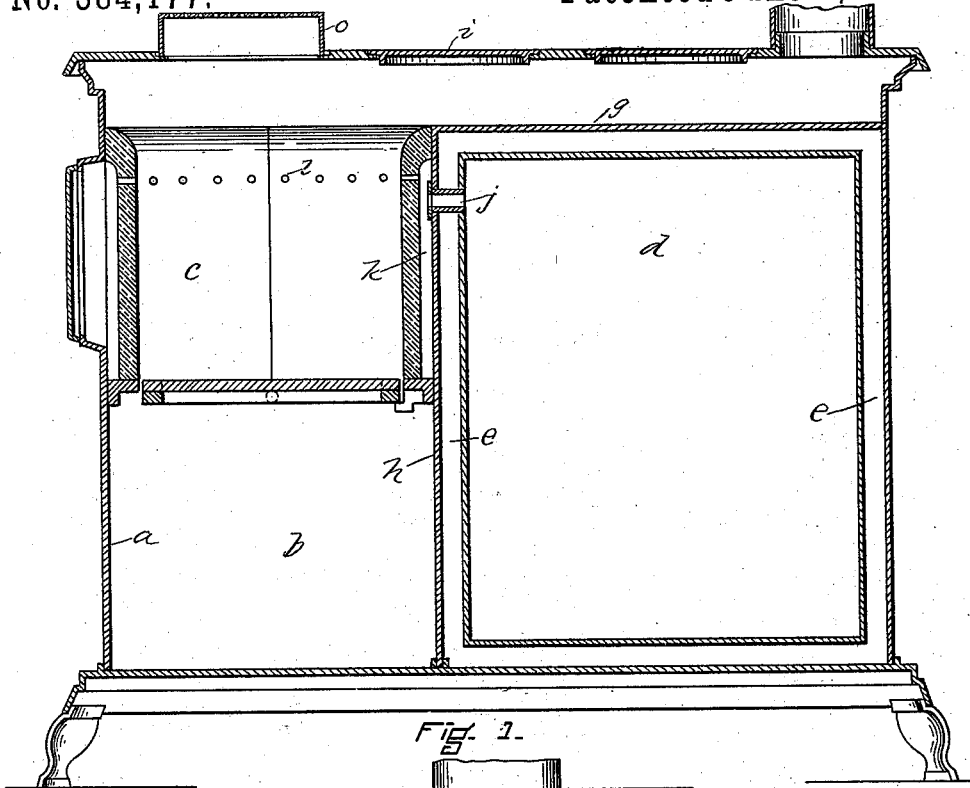


FIG. 1.

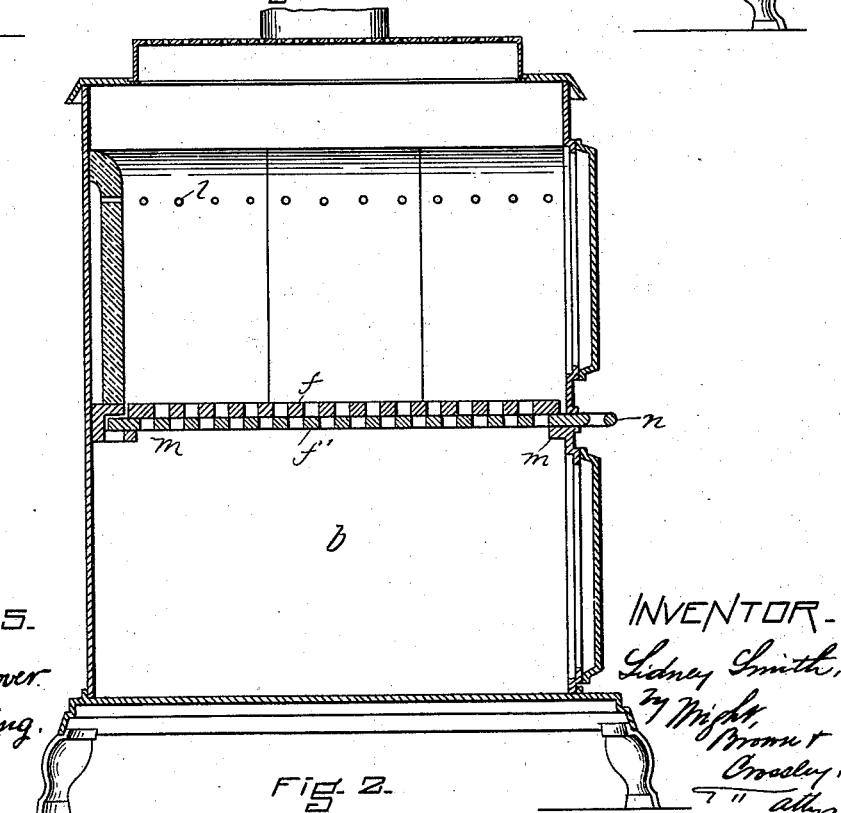


FIG. 2.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

SIDNEY SMITH, OF CAMBRIDGE, MASSACHUSETTS.

## OVEN.

SPECIFICATION forming part of Letters Patent No. 384,177, dated June 5, 1888.

Application filed April 7, 1887. Serial No. 233,991. (No model.)

*To all whom it may concern:*

Be it known that I, SIDNEY SMITH, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Ovens, of which the following is a specification.

My invention relates to ovens, or stoves provided with ovens, used chiefly for baking purposes.

My invention has for its object the provision of means whereby an oven may be evenly or uniformly heated by the consumption of a minimum amount of fuel, the clogging of the flues by soot and other products of combustion avoided, and other advantages gained, all as hereinafter fully set forth.

Of the drawings accompanying and forming a part of this specification, Figure 1 represents a longitudinal vertical sectional view of a stove embodying my invention. Fig. 2 represents a transverse section of the same through the fire-box.

Similar letters of reference indicate similar parts in both figures.

*a* represents the stove-casing; *b*, the ash-pit; *c*, the lining of the fire-box; *d*, the oven; *e*, an air-tight chamber completely surrounding the oven, and *f f'* the grate.

Instead of providing the stove with fire-flues around the oven for the purpose of heating the latter, as is usual in stoves as commonly constructed, in my invention the surface of the oven, when the fire and the products of combustion are usually applied for the transmission of the heat to the oven for baking purposes, are enveloped with the air-tight chamber *e*, and the heat of the fire is applied to the outside surface of said air-chamber. By heating the air on one or more sides of the air-tight chamber *e* the heat will be passed around the entire oven by the circulation of the air in the said chamber. In the present example I have shown a construction or arrangement of parts adapted to apply heat to but two sides of the air-chamber *e*—viz., the front or side *h* adjacent to the fire-box and top *g*, though it is evident that additional sides of the chamber might with a slightly-modified construction have heat directly applied thereto. One of the advantages of this plan

over stove-ovens as ordinarily constructed is the avoidance of the rear and bottom fire-flues around the oven, which are sure to become filled to a greater or less extent with soot and whatever may be carried into them by the combustion of the fuel, and especially in the case where bituminous coal and wood and the lighter and non-inflammable fuels are used. It is apparent and well known that said clogging and coating of the least accessible fire-flues not only obstructs the draft, but prevents the heat from passing freely to the oven, and also necessitates great care in removing said obstructions, in order to prevent the utter condemnation of the stove for practical use.

By my invention only such surface or surfaces as are easy of access are directly subjected to the products of combustion, in order to heat the oven, which surfaces, in the present example, as stated, are the front *h* and top *g*, which latter only is liable to become coated with a deposit of soot and the like, which matter can be easily removed by taking off the usual covers, *i i*, from the top of the stove. In constructions where the heat is applied to the perpendicular sides only of the air-chamber *e*, even this slight inconvenience will be avoided.

By my invention the air in the closed air-chamber *e* will be uniformly or nearly uniformly heated throughout, and as a consequence heat the oven *d* uniformly on all sides, preventing the so called burning of the thing being baked or roasted on the side next to the fire, as is common in ovens as ordinarily constructed.

*j* represents a short pipe or tube connecting the interior of the oven *d* with an air-space, *k*, intermediate of the lining of the fire-box and the adjacent casing of the stove. The fire-box lining is provided with a number of holes or perforations, *l*, connecting the air-space *k* with the interior of the fire-box, which permits the steam from whatever is being baked in the oven to escape into the air-chamber *k* and thence into the fire-box or ash-pit below.

In my invention the grate is formed in two parts, one part of which, *f*, is stationary, and the other part, *f'*, movable on ways *m m* by a handle, *n*, or other suitable device. The ob-

ject of this double grate is to provide for the partial or entire closing of the interstices between the grate-bars for the most economic use of different kinds of fuel. For instance, when  
 5 there is a strong chimney-draft and a large amount of hydrogen in the fuel, by nearly or quite closing the openings between the grate-bars and admitting air for combustion at or near the top of the fuel, as hereinafter de-  
 10 scribed, greater economy and effectiveness are secured and a prolonged and steady heat maintained, which steadiness is necessary for satisfactory results.

In making a fire with bituminous coal the  
 15 most advantageous and economical method is to fill the fire-box to its proper height with coal and then ignite the coal first on top by means of the draft of air for combustion through the perforations *l* near the top of the fire-box lining, and through the perforations in the top  
 20 of the casing *o*, as hereinafter described, the openings in the grate being closed by the movement of the grate *f'* to the position shown in Fig. 2 of the drawings. The grate can be  
 25 opened, if desired, when only the carbon portion of the fuel remains to be burned. By this a quick fire may be secured, economy in the use of fuel effected, and fuliginous smoke avoided.

30 The casing *o* is made removable and is adapted to fit on the flanges of the openings at the top of the stove, occupied by the center-piece and covers immediately over the fire-box. Said casing has a horizontal top, which  
 35 is higher than the top of the stove and is provided with numerous fine perforations. The object of this removable perforated casing above the top of the stove is to provide an ample combustion-chamber above the fuel, so  
 40 that the gases from the coal or wood can be penetrated by the atmospheric air as the latter is drawn down through the said perforations, thus providing the necessary chemical conditions for perfect combustion--viz., the  
 45 equivalent of oxygen for the hydrogen and carbon and the three perfectly diffused and in contact, atom with atom, and all at a high temperature.

If desired, the casing of the stove surround-  
 50 ing the air-tight chamber *e* at the points or sides not directly subjected to heat from the

fire-box may be coated or covered with asbestos or like non-conducting material, and thus confine the heat entirely to said chamber.

I am aware that a perforated pot-hole cover  
 55 has been applied to a stove, said cover being of an inverted-V shape and perforated so that its inclined surfaces will project somewhat above the top of the stove for the purpose of illuminating the room, as shown in Patent No.  
 60 106,688. I am also aware that a horizontal cover which, when in place, is flush with the top of the stove, has been provided with holes to admit air to the fuel in the fire-box, as  
 65 shown in Patent No. 42,968. My removable casing differs from both of the covers referred to in that it has imperforate sides supporting a horizontal perforated top, which is elevated  
 70 above the top of the stove. The casing therefore adds greatly to the usual combustion-space above the fuel, besides being adapted to support cooking-utensils on its perforated top.

Having thus described my invention, I claim--

1. A stove having a fire-box, a space, *k*, and  
 75 perforations *l* in the lining thereof, an oven, a confined or dead air chamber surrounding the oven, and a tube or flue, *j*, extending through one side of said chamber and connecting the  
 80 upper portion of the oven with the space *k*, whereby gases, odors, &c., from articles in the oven may escape to the fire-box.

2. In a stove or range, the combination, with the fire-box, of the bottomless casing *o*, having  
 85 closed or imperforate sides located above the top of the stove and coinciding with an opening therein, and provided with a horizontal perforated top higher than the top of the stove, the interior of said casing constituting a chamber  
 90 above the top of the stove communicating with the fire-box and receiving air through its perforated top to be mingled with the gaseous products of combustion between the fire-box and the top of the stove, as set forth.

In testimony whereof I have signed my name  
 95 to this specification, in the presence of two subscribing witnesses, this 30th day of July, 1886.

SIDNEY SMITH.

Witnesses:

A. D. HARRISON,  
 H. BROWN.