

(No Model.)

W. H. THOMPSON.  
OVEN.

2 Sheets—Sheet 1.

No. 309,366.

Patented Dec. 16, 1884.

FIG. 1.

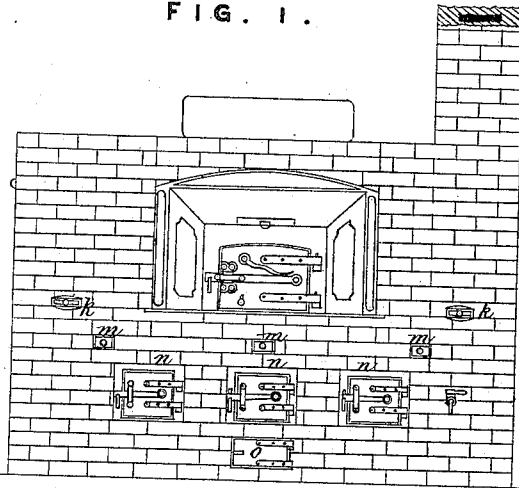


FIG. 5.

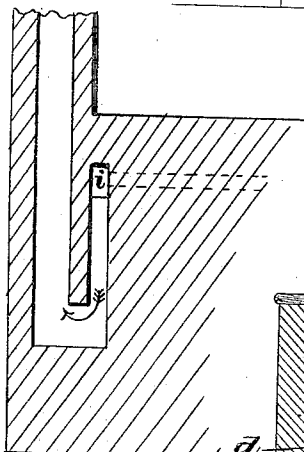
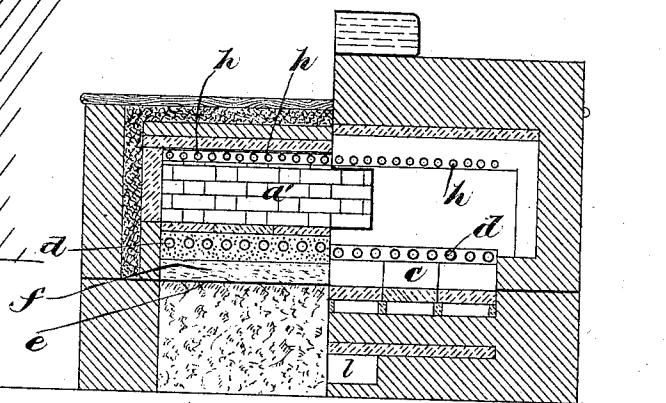


FIG. 2.



Witnesses

*Chas. J. Hyer*  
*Robert Everett*

Inventor,

*William H. Thompson*

By

*James L. Norris*

Atty.

(No Model.)

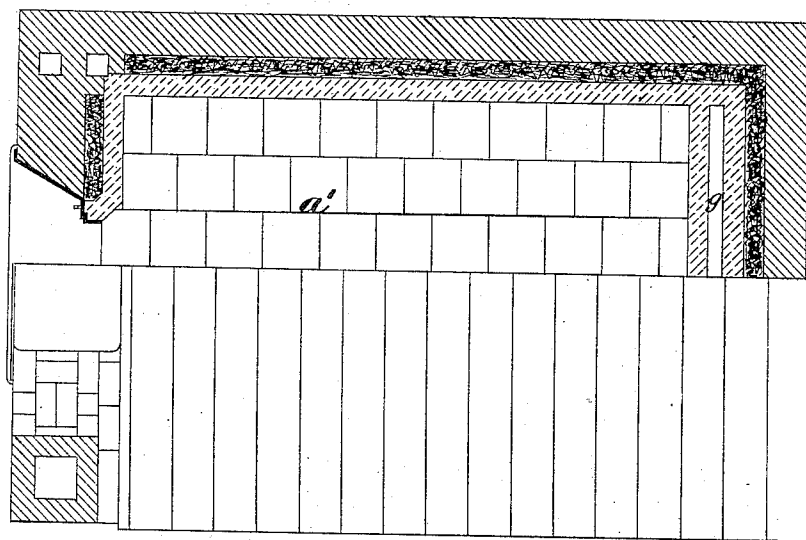
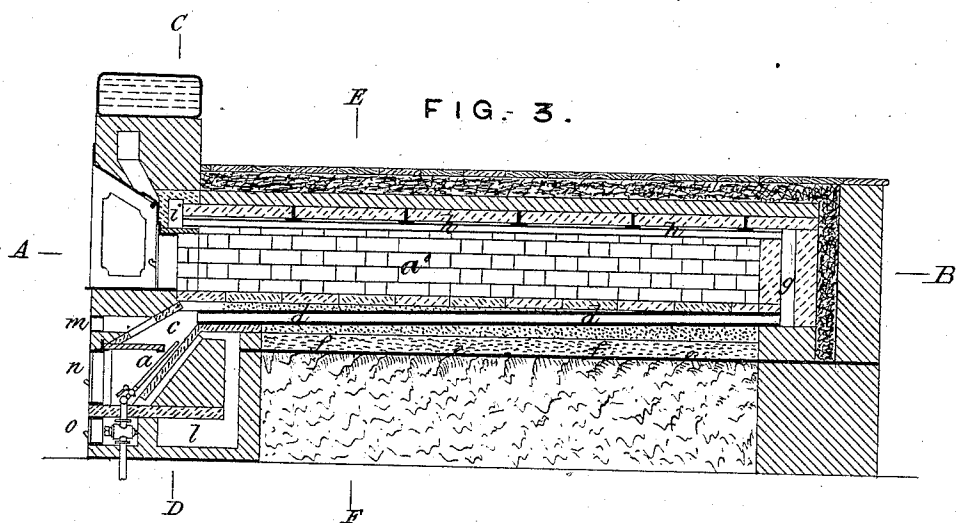
W. H. THOMPSON.

2 Sheets—Sheet 2.

OVEN.

No. 309,366.

Patented Dec. 16, 1884.



Witnesses,

Chas. Nye.  
Robert Everett.

Inventor

William H. Thompson.

By James L. Norris,  
Att'y.

# UNITED STATES PATENT OFFICE.

WILLIAM HENRY THOMPSON, OF QUEEN SQUARE, LEEDS, COUNTY OF YORK, ENGLAND.

## OVEN.

SPECIFICATION forming part of Letters Patent No. 309,366, dated December 16, 1884.

Application filed December 7, 1883. (No model.) Patented in England December 21, 1882, No. 6,109.

*To all whom it may concern:*

Be it known that I, WILLIAM HENRY THOMPSON, a subject of the Queen of Great Britain, residing at Queen Square, Leeds, in the county of York, England, engineer, have invented certain new and useful Improvements in the Construction of Ovens Heated by Gas, (for which I have obtained a patent in Great Britain, No. 6,109, bearing date December 21, 1882,) of which the following is a specification.

The objects of this invention are to construct kers' and other ovens in such a manner that there shall be no smoke arising from the combustion of the fuel, such fuel being either ordinary coal-gas or any other suitable and available gas for the purpose; also to promote economy in the consumption of gas by the means and arrangements for utilizing the calorific arising from or produced by the combustion thereof, and also to enable the operatives to have the desired temperature under perfect control at all times.

In constructing ovens in accordance with this invention I make use of Bunsen or other gas-burners, and place the same either vertically, horizontally, or diagonally in such a manner that the flames enter suitably-formed flues surrounding or partially surrounding the internal walls forming the shell or lining of the oven. A sufficient number of gas-burners entering separated flues are provided in order to cause a sufficiently high temperature to be distributed in and around the oven for effectually carrying out the desired operations. When Bunsen burners are used, suitable regulating-valves are fitted to allow a proper supply of atmospheric air to enter and mix with the gas. Suitable arrangements are also made to cause the air and gas to take up and utilize the waste heat which would otherwise pass away to the chimney, by which means the air and gas arrive at and pass through the burners superheated, thus greatly conducing to economy. The flues through which the heated gases pass are carried in horizontal channels under the bottom, in vertical or parallel tiers of horizontal channels in the sides, in horizontal channels under or over the roof-lining, and, finally, sometimes in descending channels under or over the

roof-lining, and, finally, sometimes in descending channels to the foot of the chimney, and such channels may be formed of fire-brick, fire-clay, cast or wrought metal, or pipes of various sectional forms. Between the inner walls or shell of the oven and the outer walls thereof I interpose a layer or layers of wool, slag, asbestos, or other suitable non-conducting material, in order to prevent loss of heat by conduction or radiation, and to render the same economical in fuel and effectual in working. The usual flue over the door is constructed with a movable door or valve thereto, and dampers are fitted to the chimney and flues where necessary.

My said improvements are applicable and adaptable to the construction of ovens for cooking, baking bread, pastry, pottery, porcelain, art-tiles, and otherwise where definite and controllable degrees of heat are desirable or necessary; and in order that my said invention may be clearly understood, reference is hereby made to the accompanying drawings, in which similar letters of reference indicate corresponding parts in the several figures.

Figure 1 is an external front elevation of an oven constructed in accordance with my said invention. Fig. 2 is a transverse sectional elevation, the left-hand side thereof being on the line E F of Fig. 3, and the right-hand side thereof being on the line C D of Fig. 3. Fig. 3 is a longitudinal sectional elevation of the oven. Fig. 4 is a plan, partly of the top of the oven and partly on the line A B of Fig. 3; Fig. 5, a vertical sectional view of a portion of the furnace, showing the connection of flue *i* with the chimney-flue.

The burners *a* are arranged as shown in Fig. 3. Doors *m* are provided for lighting the same. The heat arising from the combustion of the gas and air passes from the combustion-chamber *c* into the lower row of metallic tubes, *d*, which are embedded in sand. Under the floor of the oven a layer of sheet-lead, *e*, is laid, to prevent damp from rising. Over this is laid a bed of fossil-meal or other suitable non-conducting material four inches thick, to prevent loss of heat, as shown at *f*, Fig. 3, and upon this is laid a bed of sand, in which the lower row of metallic flues, *d*, are laid. These

flues carry the heated gases from front to back and open into the back flue, *g*. This flue carries or conducts the heated products of combustion to the upper row of metallic flues, *h h*.

5 These upper flues are uncovered, and their outward surfaces are in contact with the air in the longitudinal oven-chamber *a'*. A portion of the heat is utilized by the lower flues and passed to the floor of the oven. These  
10 tubes, however, being embedded in sand, only pass a modified portion of the heat to the floor of the oven, reserving the remainder of the useful heat for absorption by the air of the oven by means of the upper row of uncovered  
15 metallic tubes. By these means and modifications thereof I am enabled to arrange the distribution of the heat to the top and bottom of the oven, respectively, as found desirable, according to the nature of the arti-  
20 cles, goods, or materials to which the heat is applied. The rear ends of the upper metallic flues open into a transverse flue, *i*, as shown in Fig. 3, and this flue opens into downcast side  
25 flues, as shown in Fig. 5, which act as heat-traps, and convey the residue of the products of combustion down to the foot of the chimney. Damp-  
30 ers *k k*, Fig. 1, control the currents in these flues. A cistern for heating water is placed upon the oven to utilize waste heat. Air is allowed to enter and traverse the flues *l* for the purpose of absorbing some of the waste

heat. The air is conducted to the space *a*, Fig. 3, where it mixes (in a highly-heated state) with the gas, and therewith is burned in the combustion-chamber *c*. The doors *m m*, 35 Fig. 1, are for the purpose of lighting the burners, the doors *n n* are for the purpose of regulating the cocks of the burners, and the door *o* is for the purpose of regulating the admission of cold air to the regenerative flues. 40

Having thus particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I claim—

The combination, with the oven having the 45 longitudinal oven-chamber *a'*, the rear vertical flue, *g*, and the combustion-chamber *c*, of the chimney, the top flues, *h*, the gas-burners *a*, the layer of lead, *e*, the layer of non-conducting material, *f*, the air-flues *l*, the layer of sand, 50 and the longitudinal metallic flues in the sand under the bottom wall of the oven-chamber, substantially as described.

In testimony whereof I have hereunto set my hand this 15th day of November, 1883.

WILLIAM HENRY THOMPSON.

Witnesses:

GEO. C. DOWNING,  
8 Quality Ct., London.

J. WATT,  
17 Gracechurch St., London.