

S. T. SAVAGE.
Heating Stove.

No. 15,984.

Patented Oct. 28, 1856.

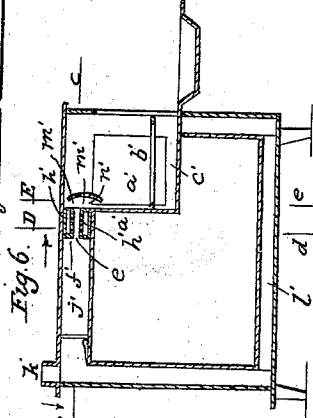
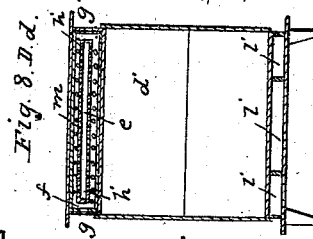
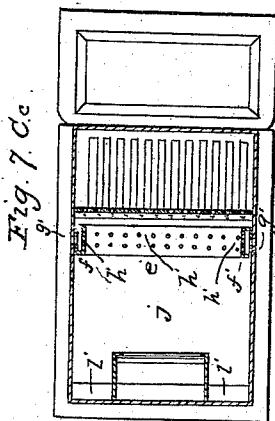
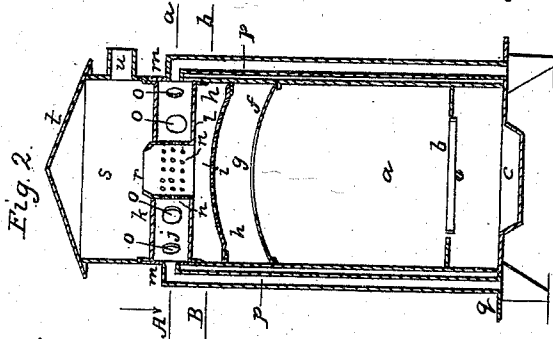
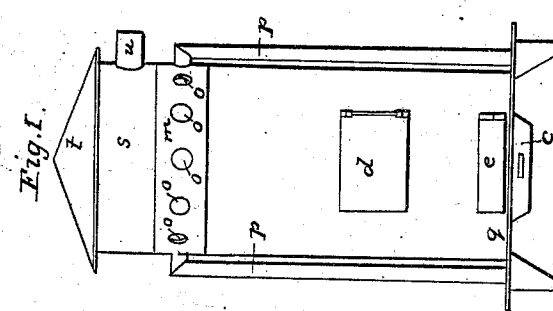
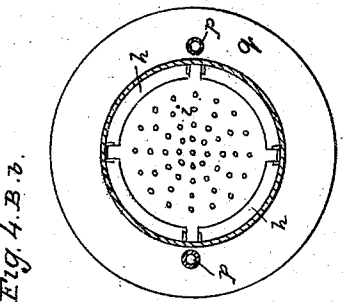
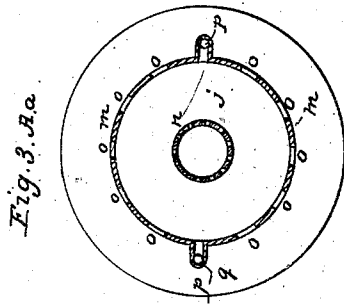


Fig. 9.

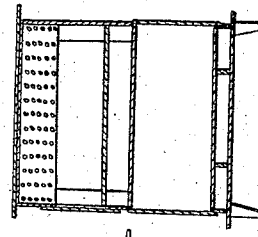
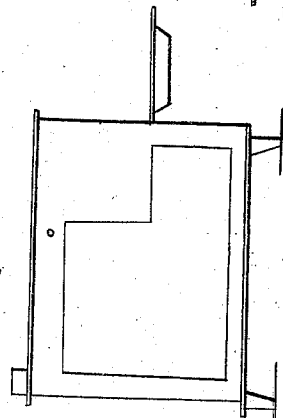


Fig. 5.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

S. T. SAVAGE, OF ALBANY, NEW YORK.

STOVE AND FURNACE.

Specification of Letters Patent No. 15,984, dated October 28, 1856.

To all whom it may concern:

Be it known that I, S. T. SAVAGE, of Albany, in the State of New York, have invented certain new and useful Improvements in Stoves and Furnaces for Burning the Gases Evolved from the Coals Under Combustion, 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 an elevation of a stove on my improved plan for heating apartments. Fig. 2, a vertical section thereof; and Figs. 3, and 4, horizontal sections taken at the lines A, *a*, and B, *b*, of Fig. 2. Fig. 5, is a side elevation of a cooking stove on my improved plan. Fig. 6, a longitudinal vertical section of the same. Fig. 7 a horizontal section thereof taken at the line C, *c*, of Fig. 6; and Figs. 8, and 9, cross vertical sections taken at the lines D, *d*, and E, *e*, of Fig. 6.

The object of my invention is to consume the inflammable gases evolved from coal in stoves and furnaces whether applied to the purposes of heating apartments, buildings, or cooking, the leading objects of my said invention being to economize fuel by the inflammation of all the combustible gases evolved from the coal, increasing the production of inflammable gases from the coal by the distilling effect of the heat generated above the coal by the inflammation of the combustible gases above the coal thereby at the same time checking the draft of air through the charge of coal, and increasing the heating effect due to the consumption of a given quantity of coal by the flame produced by the inflammation of the combustible gases in the parts of the stoves or furnace remote from the coals on the grate.

The same letters indicate like parts in Figs. 1, 2, 3, and 4. In the said figures *a* represents the fire chamber of a cylinder stove with the usual grate *b*, ash pan *c*, below, feeding door *d* for fuel, and draft door *e*, below the grate. The top plate *f*, of the fire chamber is slightly concaved upward with a large central hole *g*, for the passage of the products of combustion to a chamber *h*, above, and the sole purpose of the concave form of the under surface of this plate is the better to direct the products of combustion to the central hole. In the chamber *h*, and just over the central hole *g*, there is a circular plate *i*, of greater diameter than the hole *g*, but of less diameter than the cham-

ber. This plate is of corresponding form with the plate *f*, and perforated with numerous small holes, and the space between this plate and the plate *f*, and between the edges of this perforated plate and the circumference of the chamber *h*, is to be sufficient for the passage of the products of combustion.

Above the chamber *h*, there is an air chamber *j* formed by two horizontal parallel plates *k*, and *l*, the surrounding cylinder *m*, and a small concentric cylinder *n*, the centers of the said plates being cut out to correspond with the inner circumference of the two plates *k*, *l*. Air is admitted to the said chamber *j*, either through perforations *o*, in the surrounding cylinder *m*, or through side pipes *p*, *p*, which extend from the said chamber down to, and through the bottom plate *q*, of the stove. Either or both of these modes of supplying air to the chamber *j*, may be adopted, or the air may be supplied in any other equivalent manner.

The small cylinder *n*, is pierced with numerous small holes for the passage of air from the chamber *j*, to the inside of this cylinder, which cylinder is surmounted by a conical funnel *r*, to contract the upper end of the passage through the said small cylinder. And above the contracted upper end of the funnel *r*, there is another chamber *s*, covered by a suitable dome *t*, and this chamber communicates with the usual exit pipe or chimney *u*. Coal, either anthracite or bituminous is charged on the grate and after it has been kindled in the usual manner, the supply of air to the grate may be partially checked by closing the draft door *e*, but whether supplied with a partial or full draft below the grate combustible gases will be evolved from the coal and fill the upper part of the fire chamber and in stoves of the usual construction such combustible gases escape unconsumed to the chimney; but in this stove the atmospheric air supplied to the air chamber *j*, becomes heated in the said chamber passes through the small apertures in the small cylinder *n*, descends into the chamber *h*, and thence through the apertures in the plate *i*, to the upper part of the fire chamber, and there mingling with the heated combustible gases evolved from the coal inflames them producing an intense heat in the upper part of the fire chamber. This increased heat in the fire chamber above the charge of coal

causes the evolution of combustible gases from the coal in greater quantity than can be inflamed in the fire chamber, and in consequence it passes up through the central hole in the top plate of the fire chamber, around the edge of the perforated plate, and thence into the small cylinder *n*, where it meets and mingles with and is inflamed by atmospheric air in a highly heated state which air passes into this small cylinder from the air chamber where it is highly heated by the combustion of the gases. The products of the combustion of the coal and the inflammable gases finally pass off at the exit pipe.

In Figs. 5, 6, 7, 8 and 9, of the accompanying drawings which represent the application of my said invention to a cooking stove the same letters indicate like parts. In the said figures *a'*, represents the fire chamber with a grate *b'*, ash pit *c'*, and oven below and back of the fire chamber. At the upper part of the back plate *d'*, of the fire chamber, called the fire back there is a long narrow aperture *e'*, surrounded by an air chamber *f'*, which receives air from the room through an aperture *g'*, in each side plate of the stove. The inner plates *h'*, of the air chamber are pierced with numerous small holes to supply air to the aperture or throat *e'*. And within the fire chamber and in front of the aperture or throat *e'*, there is a perforated plate *i'*, which is wider than the said aperture. This plate is concavo convex as represented in the drawings, Fig. 6, with its concave surface toward the aperture or throat, and the edges of this plate are sufficiently distant from the fire back to permit the gaseous products of combustion to pass around the edges to and through the aperture or throat *e'*, to a chamber *j'*, communicating either directly with the exit pipe *k'*, or with the flues *l'*, passing around the oven in any suitable manner and thence to the exit pipe. The front plates of the air chamber, that is to say, that part of the fire back which forms the front plate of the air chamber is pierced with numerous small holes as at *m'*, *m'*, for the admission of air from the air chamber to the space *n'*, between this part of the fire back and perforated plate *i'*, and of course communicating with the fire chamber either through the apertures of the plate *i'*, or around its edges. As in the heating stove a coal fire being made on the grate, the combustible gases evolved from the coal will be inflamed in the fire chamber by the heated atmospheric air supplied from the air chamber through the numerous small holes. This combustion

of the gases in the fire chamber will evolve combustible gases from the coal in greater quantities, and heat the air in the air chamber to a higher temperature, so that the gases, which are not inflamed in the fire chamber, will pass to and through the aperture or throat, and beyond it in the chamber *j'*, and in thus passing along will be thoroughly mingled with highly heated atmospheric air and thereby inflamed producing a diffused flame which will impart much more heat to the stove than could be produced by the combustion of the coal in the grate alone.

I have thus described the mode of applying my said invention to a stove for heating apartments, and to a cooking stove and from these two examples any one skilled in the art of constructing stoves, furnaces and heaters, will be enabled to apply my said invention to any other variety of stoves, heaters or furnaces for heating or cooking purposes. And from the foregoing it will be seen that the mode of application of my said invention in the two examples given differ only in the form of the parts.

I am aware that many stoves and furnaces have been made with the view to economize fuel by the admission of atmospheric air above or beyond the coal to inflame the combustible gases evolved from the coal under combustion; but I am not aware that any such plans have been made on the principle of my invention. I do not wish however to be understood as making claim broadly to the use of an air chamber to supply air to the combustible gases above or beyond the coal or other fuel. Nor do I wish to be understood as making claim to the combination of a throat or narrow aperture in the flue space supplied with air for the combustion of the inflammable gases.

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

The use of the throat, aperture or passage surrounded by an air chamber and pierced with numerous small holes through which atmospheric air passes in numerous small jets to the said throat substantially as described when the said throat is located between the fire chamber, and a flue chamber leading to the exit pipe or chimney and combined with a perforated plate interposed between the said throat and the fire, substantially as and for the purpose specified.

S. T. SAVAGE.

Witnesses:

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ANDREW DE LACY.