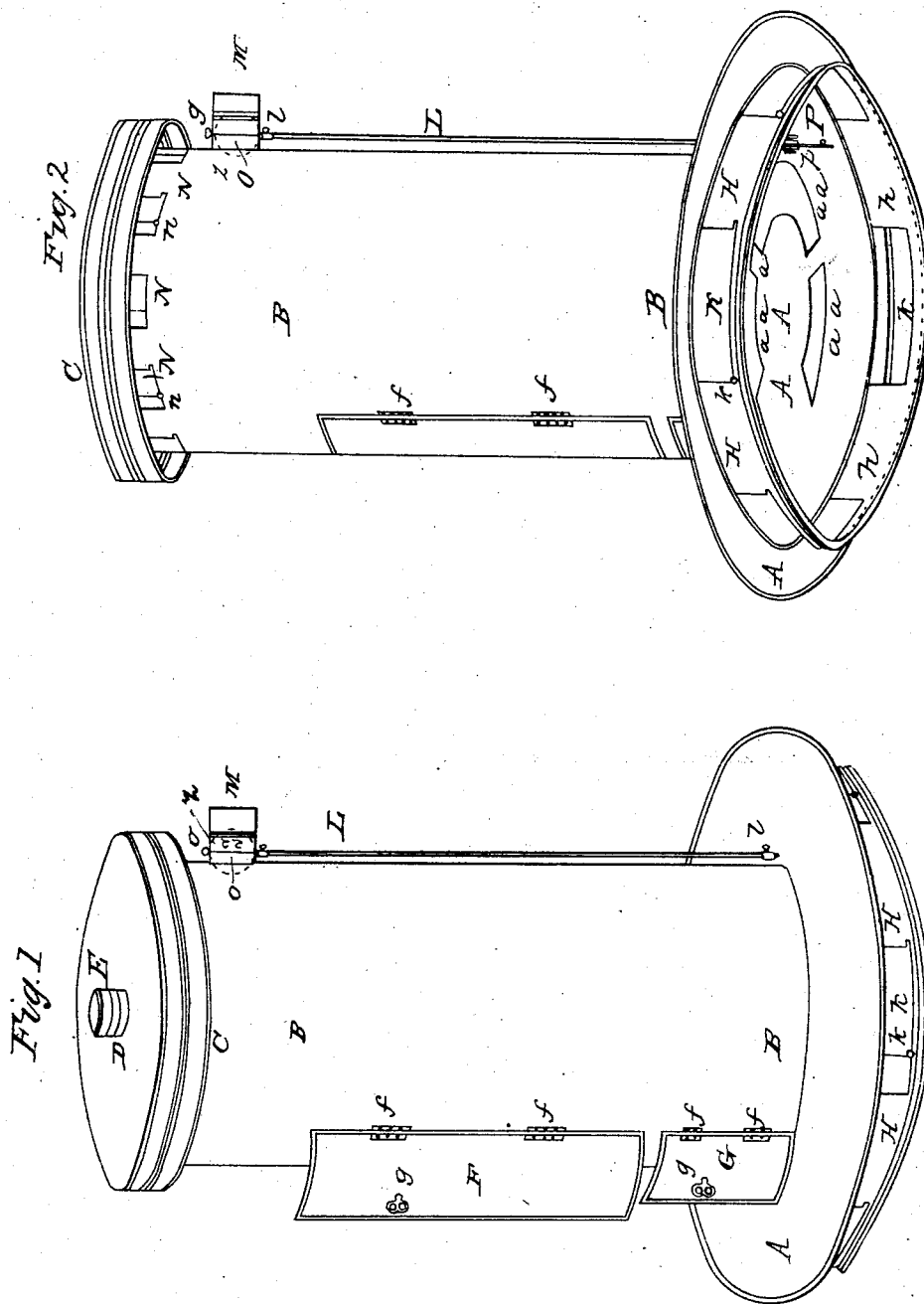


J. MILLER.  
Heating Stove.

No. 981.

Patented Oct. 16, 1838.

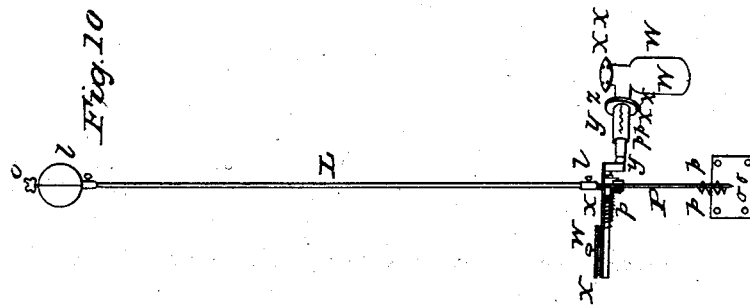


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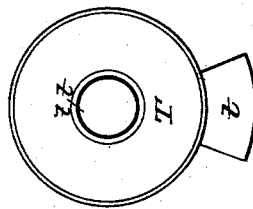
3 Sheets—Sheet 2.

No. 981.

Patented Oct. 16, 1838.



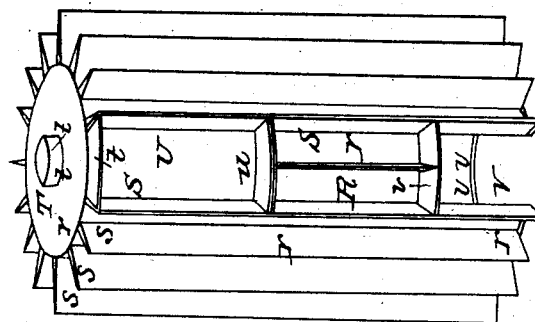
*Fig. 7.*



*Fig. 8.*



*Fig. 3.*

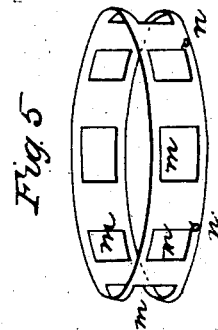
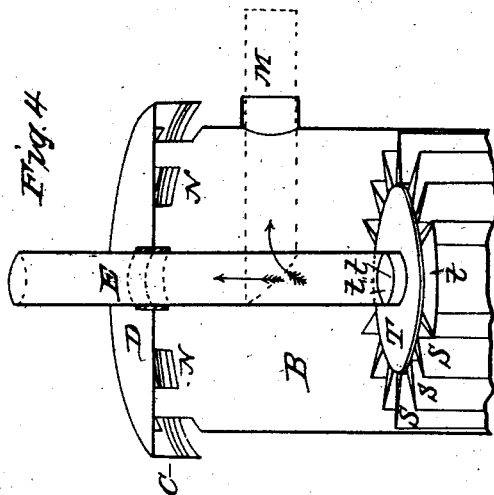
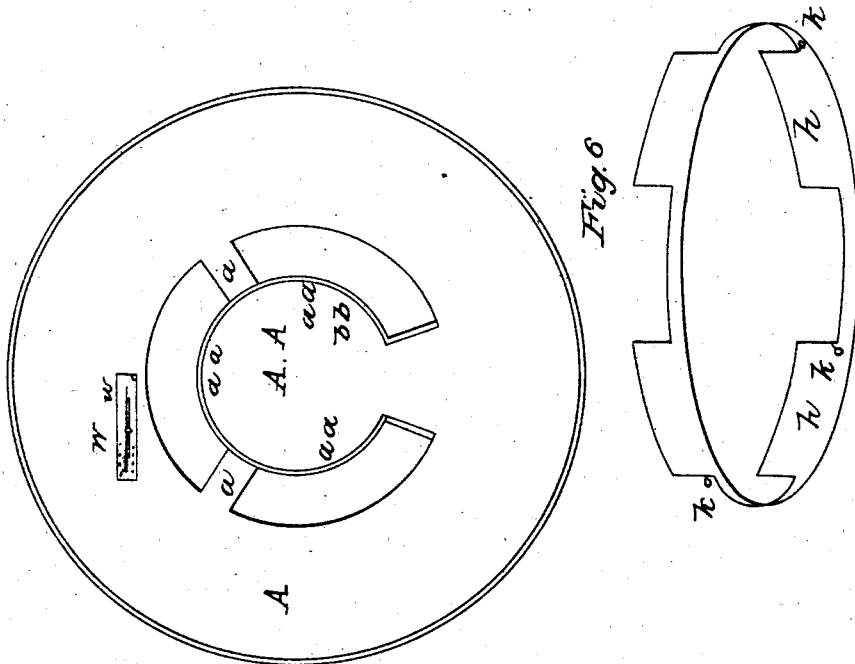


J. MILLER.  
Heating Stove.

3 Sheets—Sheet 3.

No. 981.

Patented Oct. 16, 1838.



# UNITED STATES PATENT OFFICE.

JAMES MILLER, OF BALTIMORE, MARYLAND.

## MODE OF CONSTRUCTING STOVES.

Specification of Letters Patent No. 981, dated October 16, 1838.

*To all whom it may concern:*

Be it known that I, JAMES MILLER, of Baltimore, in the State of Maryland, have invented a new and Improved Mode of Constructing Air-Heating Stoves; and I do hereby declare that the following is a full and exact description, with references to the annexed drawings, of which—

Figure I. represents the whole stove, without pipe, in an upright position; Fig. II. represents the same, as it would appear in a horizontal position, or as it would appear if viewed from below; Fig. III. represents the fire cylinder, its heat conductors, and the internal cover; Fig. IV. represents a vertical and longitudinal section of the case, and external cover; and the two courses which the smoke may take through the hot air chamber; Fig. V. represents a cylindrical hot-air valve or damper, for the case; Fig. VI. represents a cylindrical cold-air valve or damper, for the base; Fig. VII. represents the internal cover viewed vertically; Fig. VIII. represents a part sometimes separate from the fire cylinder; Fig. IX. represents the horizontal plate viewed vertically; Fig. X. represents a thermometric apparatus which may be used.

In the drawings, for similar parts, like letters of reference are used.

The base (H H, Figs. I. and II.) is made of cast or sheet iron, and has its lateral circumference of any form, oval, circular, or angular. But with the damper belonging to it, it forms a perfect lateral inclosure; and within is open, from the floor up to the horizontal plate. It has laterally one or more openings (K.) for admitting the cold air of the room; each having a valve of some kind, to graduate the air, or wholly exclude it, as circumstances may require. When the base is circular, as represented in the drawings, it may have a cylindrical damper, (as *h h*, Fig. VI.), (or like that represented by Fig. V.), of a size to fit the base, and with openings to correspond, and with knobs (*k*.) to support and move it. If the base should not be circular, but square or angular, then each side having the opening or openings, is furnished separately with its valve or damper, which may be in any form that is used, either that of a door, or of a slide. The construction of the base, its arrangement with the floor, and its combination with the horizontal plate or part above, are such as to form a cold air chamber into

which, the air to be heated may come from the room entirely; or from without entirely, through an opening, in the floor, concealed under the stove; or from both, at the same time.

The horizontal plate (A. Figs. I. II. and IX.) is cast iron, and sits upon the base. Its central part (A A.) is the floor of the ash chamber; around which is a bead raised (*b b*.) to receive the fire cylinder. Around this bead are openings (*a a*.) for air from the cold-air chamber to pass up; and between are connecting parts (*a*.) strengthening the central part.

The fire cylinder (*r, R, r*, Fig. III.) is cast iron, and as constructed, does not require any internal lining to preserve it; the conductors attached, being such, as to transfer to themselves the portion of heat, commonly kept within, by the non-conducting nature of the lining, usually employed. At the base of it is an opening (V.) to the ash chamber, to admit air to the fire. A drawer may be used in it, if required, to receive the ashes and coal. About twelve inches higher is another opening, (U.) for fuel. These openings have flanges from the cylinder, out to the case, to prevent the air heated between, from being drawn in, and passing off with the smoke. When the cylinder is not cast in horizontal sections the flange (*u*.) for the lower side of the fuel opening is cast separate. Outside of the fire cylinder, attached to it, and between it and the case, are heat conductors. These heat conductors are thin parts, projecting from the cylinder or body containing the fire, and extend perpendicularly, from a point lower than the fire, to a height of a few inches above it; or they may extend to the top of the cylinder; but the former, in general, is all that is requisite. Their thickness where joined to the main body is about three eighths of an inch, and gradually less out to their edge, giving each one the appearance of a wedge or blade. Their width, or the distance between the edge and where joined to the cylinder, is usually about two inches, or two inches and a half. Some of them are made to extend out, to the sheet iron case, to give it more substantial support. In their design and effect, they are essentially different from all kinds of flues, operating and being designed only as conductors of heat. Each, independent of the rest, first conducts heat from the cylinder, and then imparts the heat by

transmission, from its two sides, to the body of air between the cylinder and the case; which body of air is confined laterally by the case, the same without the conductors, as with them.

Those heat conductors, heretofore used, forming convoluted and spiral flues, differ from mine, as much in effect, as in their construction. Being spiral and convoluted, they divert and detain the heated air from its free natural and upright course, and keep it longer about the heated surface, by which both become more intensely heated, rendering the body containing the fire, less durable, and the air heated less wholesome for respiration. Mine, on the contrary, being perpendicular, have in their operation, all the good effects of conductors, without the injurious effects above named, attending the operation of convoluted and spiral conductors.

Although the term fire cylinder is employed, for the body containing the fire, yet the above description is designed to apply, not only to the cylindric form, but likewise to the square, and every other form, to which the perpendicular flange heat conductors may be attached. The grate may be any of the kinds in use.

The internal cover, (T, *t*, Figs. III. and VII.) for the fire cylinder, is cast iron; with a projection (*t*.) covering the top of the fuel opening. The central part has an opening and collar (*tt*.) for the smoke pipe.

The case (B, Figs. I, and II,) is the external part surrounding the heated air, the fire cylinders, and its heat conductors. It is usually sheet-iron, having its lower edge resting upon the horizontal plate around the openings (*a a*.) which admit the air between the case and cylinder. It extends to a height, of about ten or twelve inches, above that of the internal cover, so as to form the surrounding part of the hot air chamber, (as shown by Fig. IV.) At its base is a door (G,) to the ash chamber; and above it a door (F,) to the fuel opening; each secured by hinges (*f f*.) and a catch handle (*g*). A little higher than the internal cover, is an opening and collar (M,) in diameter, corresponding to that of the opening of the said cover, designed to accommodate either the smoke pipe, or a pipe to take hot air from the room. If used for the latter purpose, it is provided with a damper (O,) and with a handle (*o*.) to its axis, outside the collar; designed as a thermometric damper, to regulate the temperature of the room; or as one, simply to regulate the escape of hot air, to other apartments. In and around the case, near the top, are openings (N N,) to let out hot air into the room; and for these, a damper (N *n*.) is provided, fitting the case, with openings to correspond, and knobs (*n*.) passing through the case, to sup-

port and move it, (namely, the damper.) A sectional view of this damper is represented, by Fig. V, of which the letter *m*, represents the openings, corresponding to those of the case, referred to by the letter (N). By sliding this so as to close the hot air openings, the stove may be made to act as a common radiating one; or the air heated within be wholly taken off from the room, to warm other apartments. If the case should be otherwise than cylindrical or round, for each side having the opening or openings, a slide valve or damper, with correspondent openings, may be used.

The external cover (C, D, E, Figs. I, II, and IV,) is sheet or cast iron, and is supported by the case. It covers the hot air chamber; and if the smoke pipe passes through the side, the elbow may be used within, and concealed by the cover. It projects around and from the top of the case about three inches; and then forms a rim (C,) extending downward about four inches. This projection and rim conceal the openings of the case, and give the hot air flowing out, a downward direction, by which it is better mixed and diffused. The central part has an opening a collar (E,) which also corresponds to that of the internal cover; being for the same purpose as the opening and collar (M) at the side; namely, to accommodate either the smoke pipe, or a pipe to take hot air from the room.

Fig. IV, represents the two courses which the smoke pipe may take through the hot air chamber; one, by two full lines through (E,) the other by two dotted lines through (M). The opening and collar (E,) of the top, and the one (M,) of the side are so arranged with the opening (*t t*.) of the internal cover, that either of the former, (E, or M,) may be used for the smoke pipe to pass through; and the other be used for a pipe to take hot air from the room; as each, heretofore, separately described.

A thermometric apparatus may be attached to the axis of the damper (O,) to turn it open, and let the hot air escape from the room, whenever its temperature exceeds any desired degree; instead of doing it by hand. Being represented in the drawing, the following is given as a description thereof: A connecting rod, (L, Figs. I, II, and X,) attached and secured to the axis of the damper, by a pin or screw (*l*.) extends vertically downward, nearly to the horizontal plate; where, by another pin or screw it is connected to another rod (P,) extending in the same line down to a small plate (*o o*.) which is on the floor, and in which it may turn by a point or pivot. Immediately below the plate, through which it passes, it is provided with a cog wheel (*p*.) and at the small plate (*o o*.) with a coil spring, to keep the damper closed, against a pin (*z z*.) in

the collar (M,) until opened by the effect of a too high degree of temperature. In the horizontal plate, and near the rod last named, is a thermometric scale (W,) graduated with the higher degrees more remote from the rod, and having a narrow opening in the middle. To slide on the scale (of degrees), is an index (*w*,) connected through the narrow opening, to one end of a cog bar (X,) so that when one moves, the other must. At one side of the bar are small cogs (*x*,) to act with the cog wheel of the connecting rod. A vessel (W W,) containing mercury or some metallic fluid, is placed in a line with the bar, beyond the perpendicular rod, in a current of air, as it flows in from the room into the stove; and secured to the under side of the horizontal plate, by a flange (*x x*,) where, by its situation, its temperature will correspond to that, of the air of the room. Proceeding from this, toward the bar, is a short tube, with a flange; to which, by a flange (*x x*,) similar, a piston tube (Y,) is attached; with a thin cover of india rubber (or gum elastic) between, to confine the fluid, and secure all its expansive power. A small piston rod (*y*,) placed in the tube, and drawn by a coil spring (*p p*,) against the cover of the fluid, will complete the apparatus. To set it, for the degree of temperature wanted: Loose the connecting

rod; and closing the damper, move the index to the proper degree; then fasten the rod.

I do not claim either of the parts of this stove taken individually, but

I do claim—

The said stove, as the respective parts have been combined and arranged by me; that is to say, a stove having a base constituting a chamber for the admission of cold air from the room, or from without the apartment, governed by valves or dampers, as set forth, the air thus admitted passing up between a double shell, or case; having thin perpendicular heat conductors attached externally to the surface of the inner cylinder; and these I claim in combination with the collared opening at the top, so arranged that the smoke pipe may pass either through the top of the stove, or laterally, and the heated air if desired, be conducted to other apartments; and in combination also with the projecting cover, or top, descending and covering the openings for admitting heated air, which openings are regulated by valves, or dampers. The whole constructed and combined substantially as set forth.

JAMES MILLER.

Witnesses:

JOHN H. TITCOMB,  
HENRY BISHOP.