

(No Model.)

2 Sheets—Sheet 1.

I. D. SMEAD.

STOVE.

No. 273,402.

Patented Mar. 6, 1883.

Fig. 1.

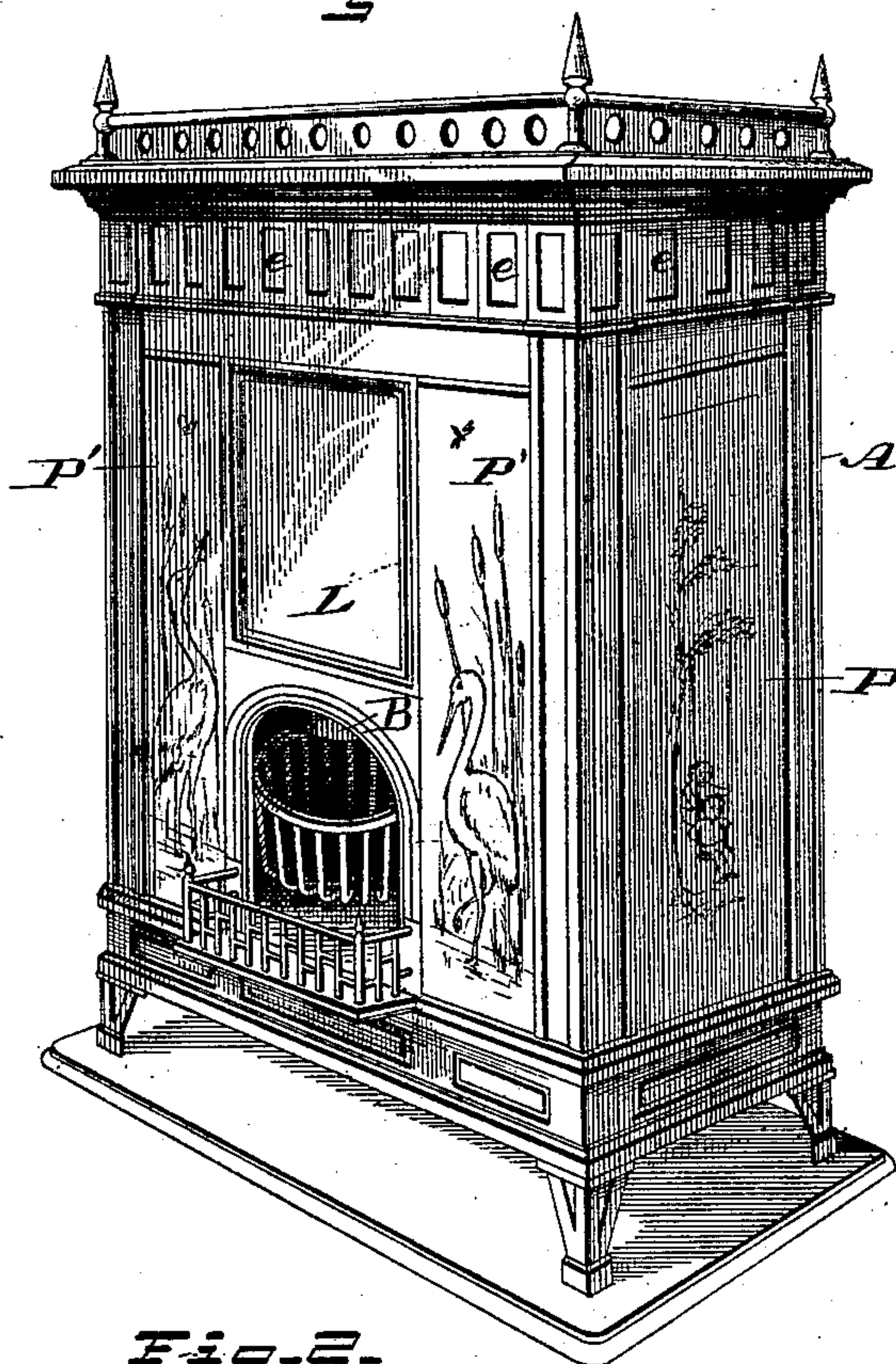
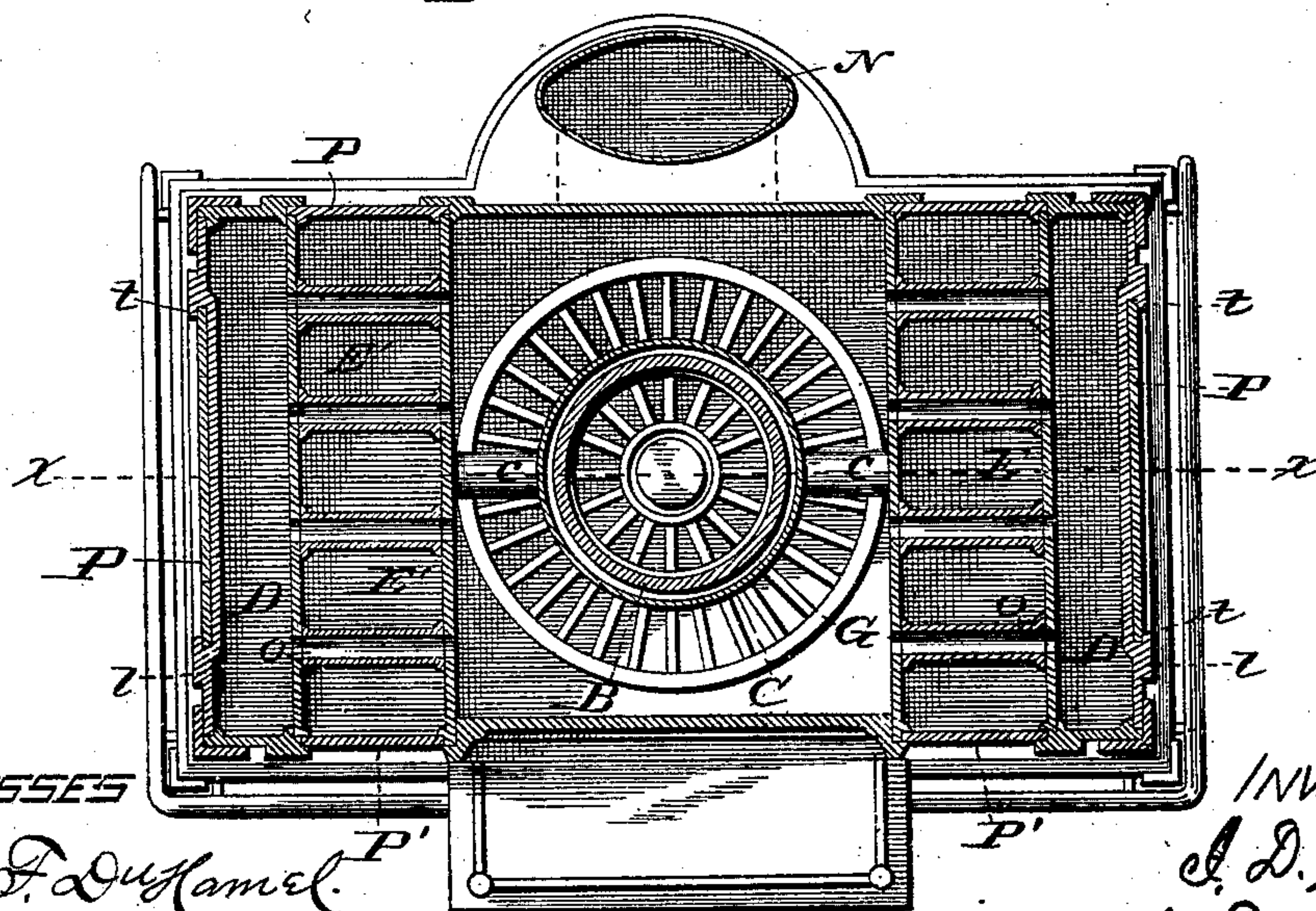


Fig. 2.



WITNESSES

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

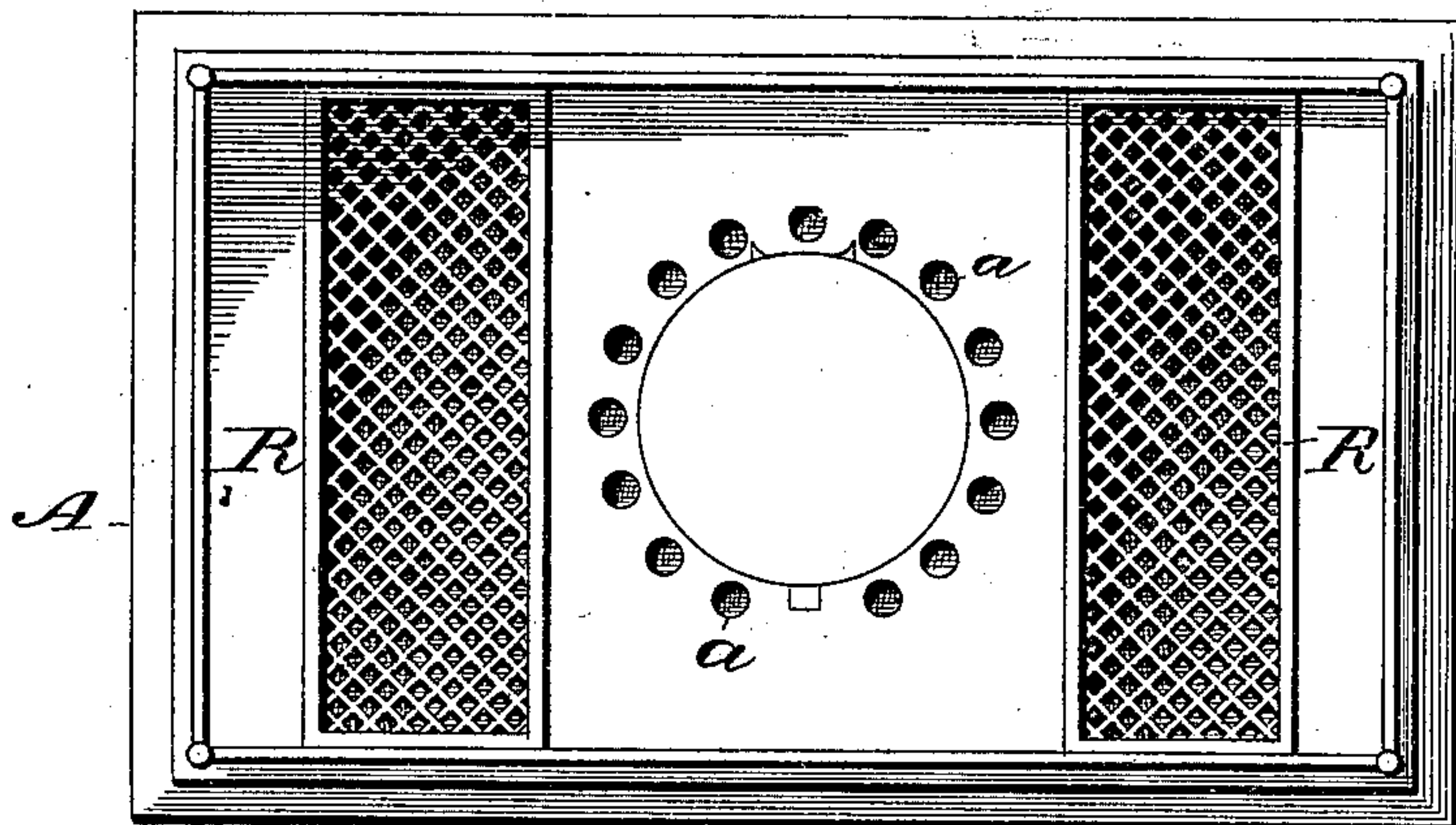


Fig. 4.

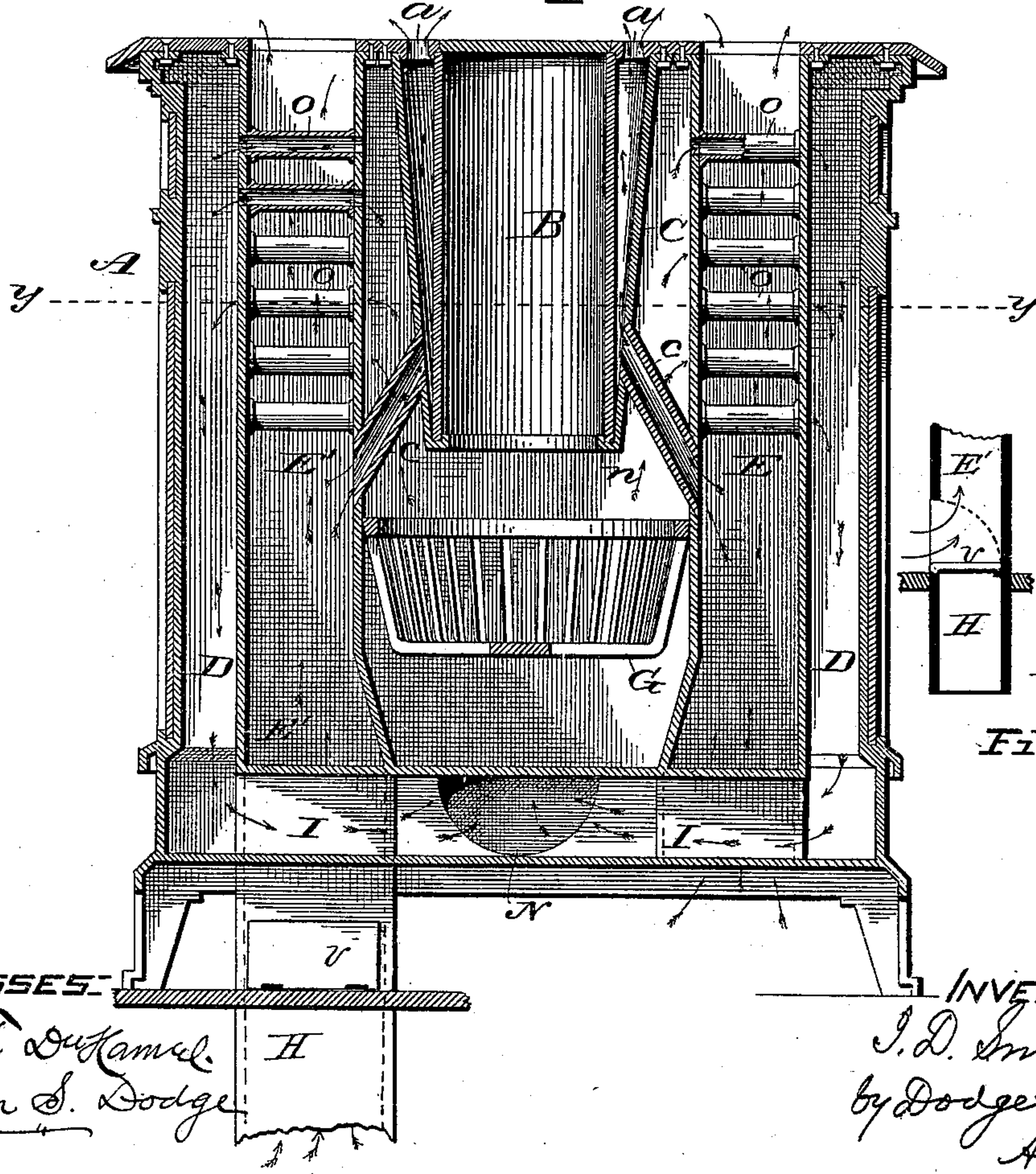


Fig. 5.

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UNITED STATES PATENT OFFICE.

ISAAC D. SMEAD, OF TOLEDO, OHIO.

STOVE.

SPECIFICATION forming part of Letters Patent No. 273,402, dated March 6, 1883.

Application filed November 9, 1882. (No model.)

To all whom it may concern:

Be it known that I, ISAAC D. SMEAD, of Toledo, in the county of Lucas and State of Ohio, have invented certain Improvements in Stoves, of which the following is a specification.

My invention relates to stoves; and the invention consists in certain combinations of devices and details of construction, as hereinafter more fully set forth.

Figure 1 is a perspective view of a stove embodying my invention. Fig. 2 is a transverse horizontal section taken on the line *yy* of Fig. 4. Fig. 3 is a plan view of the top, and Fig. 4 is a transverse vertical section on the line *xx* of Fig. 2. Fig. 5 represents the air duct and valve.

The object of this invention is to produce a magazine-stove which shall be ornamental in appearance and possess great heating capacity, while economizing the use of fuel, and which shall serve to heat a column of fresh air brought from outside the room or reheat the air in the room, or both, as may be desired, and which may also be used as an open or as a closed stove, at will.

In the accompanying drawings, A represents the body of the stove, which I prefer to make rectangular in form, though it may be made oval, or partially so, if preferred. In the center I locate a magazine, B, below which I place a basket-grate, G, as represented in Fig. 4, there being an opening in the front wall in front of the grate, as shown in Fig. 1, which opening may be closed by a removable plate, when desired.

The body of the stove is divided by tight vertical partitions into five spaces, as shown in Fig. 4, the central space being occupied by the magazine and grate and constituting the combustion-chamber, and which is connected on opposite sides by a series of horizontal tubes, *o*, with the two outer spaces, D, which form descending smoke-flues, and at their lower ends enter a transverse flue, I, located at the base of the stove, this latter flue I connecting at its center with a vertical flue, N, which ascends on the back side of the stove, as shown in Fig. 2. A transverse flue provided with a damper for direct draft connects the combustion-chamber on its rear side, near the top, with this vertical flue N, as indicated by the dotted lines in Fig. 2. The spaces or flues E

between the combustion-chamber and the smoke-flues D, on each side, are air-flues, open at top and bottom, their top being provided with a grating, R, as shown in Fig. 3. One of these air-flues E is extended down to the floor, as shown at E', Fig. 4, where it is to connect with a tube or duct of suitable construction for the introduction of fresh air from out-of-doors; or, if preferred, in cases where the stove stands near the outer wall, or where for any reason it is not convenient to place the air-duct under the floor, it may be placed above the floor, the only requisite being that it shall connect with the flue E'. This flue E', which connects with the air-duct H, as shown in Fig. 5, is provided with a valve, *v*, so arranged that as it is thrown over to close the air-duct, as represented in the left-hand part of Fig. 5, it opens the passage or inlet in said flue E' above the floor, thus shutting off the air from the outside of the room and admitting air from within the room. When it is desired to admit fresh air from the outside, the valve *v* is to be turned up, as shown in the right-hand part of Fig. 5, by which operation the outer air-inlet is opened and the inner one closed, the one valve thus serving to open one inlet as it closes the other, and vice versa.

I have shown the outside air-duct as coming up through the floor; but it may, if preferred or found necessary, be brought in on a horizontal line above the floor, and connect with the flue E' between the bottom of the stove and the floor at one side. In that case the valve *v* will necessarily be hinged in an upright position so as to swing horizontally instead of vertically; or, if the outer air-duct be made to connect with the flue E' on its rear side, then the valve *v*, instead of being pivoted or hinged, may be arranged to move bodily back and forth, and operate in the same manner. By this arrangement it will be seen that the air which is brought from the outside of the room passes up through the flue E', while air from within the room passes up through the other; or, in case it be very cold and it is desired to heat the air in the room more rapidly, the air within the room may be made to pass up through both flues simultaneously, and thus keep up a continuous circulation and reheating of the air within the room.

The magazine B, I surround by a metal cas-

ing, C, as shown in Fig. 4, this casing being united to the magazine at its lower end, but being inclined from the wall of the magazine as it ascends, thus forming an annular air-chamber around the magazine of a continuously-increasing size as it ascends. This air-chamber has a series of holes or openings, *a*, at its top, as shown in Figs. 3 and 4, and near its bottom it is connected by two or more inclined tubes, *c*, with the air-flues E, as shown clearly in Fig. 4, by which means a portion of the air which enters the flues E passes into the space around the magazine, and from thence out through the top of the stove. The gases and products of combustion, as they pass upward, impinge against the outer inclined surface of the casing C, whereby the air that passes up through the space between this casing and the magazine is rapidly heated.

It will be observed that the horizontal tubes *o*, which connect the combustion-chamber with the descending smoke-flues D, are quite small—about two inches in diameter—and are quite numerous, the object being to divide the heated products of combustion up into numerous parts or currents, and thus make them heat a much larger surface of tubes than they would if allowed to pass off through a single tube of large diameter. As shown by Fig. 2, there are four rows of these tubes, and, as represented in Fig. 6, there are six tubes in each row, thus making twenty-four on each side, or forty-eight in a single stove.

In order to prevent the air from passing too quickly through the flues E, the tubes *o* may be set zigzag—that is, the tubes of one row may be placed over the spaces between those of the row below—and thus the air, instead of ascending in straight lines, will be compelled to impinge more directly against these tubes, and to pass back and forth among and around them, thus utilizing the heat and economizing the fuel to the best advantage. Whatever heat may remain after passing through the tubes *o* will be utilized in heating the outer walls, the bottom, and the back of the stove, which parts will never be heated to that extreme degree which often renders ordinary stoves so disagreeable and unpleasant.

By removing the detachable plate at the front, and which will preferably be made in the form of an ordinary blower, the entire front of the grate will be exposed, as represented in Fig. 1, thus presenting all the advantages of an open-grate or Franklin stove, with the other advantages heretofore mentioned added.

As shown in Figs. 2 and 4, ornamental tile P are secured to the outer surface of the end plates, *l*. In case these plates are made to extend in a right line vertically to the top without any outward projection, then they may be cast with the vertical overlapping flanges *t* and the tile be slipped in from the top. If, however, these plates *l* be recessed or provided with sunken panels, as represented, then the flange on one side only will be cast on the plate, the other being detachable to admit of the in-

section of the tile; or, if preferred, a light frame extending around the face of the tile at its edges may be used to hold it in place, similar to the method used for securing the mica sheets in ordinary stoves. In like manner the other plates, front and rear, are so formed with suitable grooves as to permit ornamental tiles P' to be held thereby, these latter forming the outer walls of the air-flues, as shown in Fig. 4.

The space in the front wall above the grate may also be filled in with a tile; or it may have mica arranged to let the light shine through, if preferred, though I prefer to use tile, especially when the stove is designed to be used as an open one. In like manner smaller tile may be arranged in the spaces around the upper portion, as indicated at *e*, Fig. 1, and thus it may be rendered highly ornamental.

The central or bottom portion of the grate may be made to rotate or shake and tip in any of the well-known ways, if desired.

As shown in Fig. 4, the magazine B is held in position by means of the surrounding case C, the lower end of which is provided with an inturned lip, *n*, on which the lower end of the magazine rests, while its upper end fits in an annular groove in the top plate, as shown in Fig. 4, the case C being secured to the top plate by bolts or screws, as represented in said Fig. 4.

By this construction I produce a stove which, with its magazine and casing, its numerous horizontal tubes, and its flues D, I, and N, presents an unusually large heating-surface, and which, by means of its air-flues, will warm a large volume of air with rapidity, while at the same time its external walls are not heated to anywhere near the degree that ordinary stoves usually are, the heating being mainly effected by indirect rather than by direct radiation. By means of its air-flues it is also made to secure a constant introduction of fresh air into the room, and also to cause a thorough circulation of the air in the room, and, when desired, to heat the air in the room very rapidly. It combines all the advantages of a magazine and closed stove with those of an open stove, and at the same time admits of a high degree of ornamentation, and by means of its horizontal tubes, reverse flues, air-ducts, &c., utilizes the fuel to an unusual degree, thus combining beauty and utility with convenience and healthfulness, as is believed, to an extent not heretofore accomplished.

Having thus fully described my invention, what I claim is—

1. The combination, in a stove, of a central combustion-chamber provided with a grate, G, and a magazine, B, the vertical air-chambers E and E', the two descending smoke-flues D D, connected to the combustion-chamber by a series of horizontal pipes, *o*, and the transverse base-flues I, leading to the smoke-pipe N, all constructed and arranged to operate substantially as described.

2. The air-flues E and E', arranged to operate with the combustion-chamber and the heat-

ing-pipes *o*, substantially as shown, the flue
E' being connected with a duct, H, for admit-
ting air from the exterior of the room, and the
flue E arranged to receive air from within the
5 room simultaneously, as and for the purpose
set forth.

3. The combination, in a stove, of the mag-
azine B, with its casing C, and the air-inlet
pipes *c c*, one connecting with the flue E and

the other with the flue E', whereby air is ad- 10
mitted to the heating-chamber around the
magazine, both from without and from within
the room simultaneously, as set forth.

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Witnesses:

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