

M. A. CUSHING.
Heating-Stove.

No. 160,398.

Patented March 2, 1875.

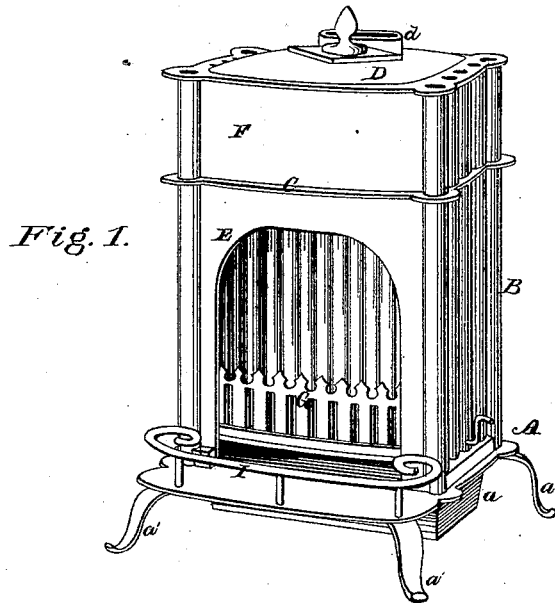


Fig. 1.

Fig. 2.

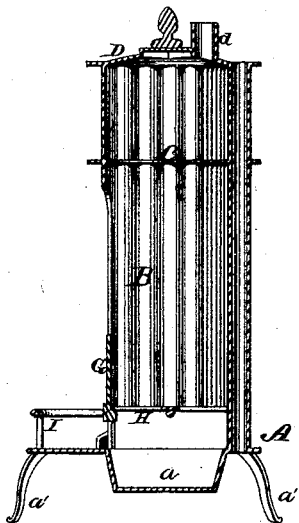


Fig. 3.

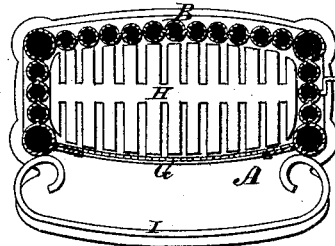


Fig. 4.



WITNESSES

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MARK A. CUSHING, OF AURORA, ILLINOIS.

IMPROVEMENT IN HEATING-STOVES.

Specification forming part of Letters Patent No. **160,398**, dated March 2, 1875; application filed June 16, 1874.

To all whom it may concern:

Be it known that I, MARK A. CUSHING, of Aurora, in the county of Kane and State of Illinois, have invented a new and useful Improvement in Open Stoves; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings and to the letters of reference marked thereon.

The object I have in view is an improvement in open heating-stoves, whereby the same may be rendered more durable in wear and more efficient for heating purposes, with the consumption of a less amount of fuel than that which is ordinarily used in heating-stoves of the same capacity; and my invention therein consists in constructing the back and sides of my stove of vertical tubes placed in juxtaposition, said tubes being open at the top and bottom, to allow the surrounding air to circulate freely up through them, thereby causing a rapid circulation of air in the apartment in which the stove may be placed, heating in the quickest manner possible, and at the same time having the greatest amount of heating-surface.

To enable those skilled in the art to make and use my invention, I proceed to describe the same in connection with the drawings, in which—

Figure 1 represents a perspective view of my stove; Fig. 2, a vertical section on the line *x x*; Fig. 3, a horizontal section on line *y y*; Fig. 4, a cross-section of any three tubes of the combustion-chamber on an enlarged scale.

Like letters denote similar parts in each figure.

In the drawing, A represents the base of my stove, which has a rectangularly-shaped depression or ash-pit, *a*, beyond the sides and rear of which the base extends sufficiently to allow the superstructure to rest upon it, and in front to form a proper hearth for the stove. The base A rests upon four legs, *a'*. The superstructure consists primarily of a series of vertical tubes, B, which form the back and ends of the stove, the general outline of a cross-section of which is rectangular. The tubes are placed in juxtaposition, and rest upon the flanged part of the base A, which is pierced so that the bottom of the tubes may

be fully opened. Each of these is provided with a rib, *b*, extending throughout its length on one side, and a groove, *b'*, on the other side, which receives the rib of the contiguous tube. At about three-fourths of the height of the stove from the base the tubes B pass through a diaphragm, C, which has in addition a segmental opening to allow the passage of the products of combustion. The top of the stove is composed of a plate, D, which rests upon the tubes B, and which is pierced also that the upper extremity of the tubes may be fully open. The central part of the cap-plate D bulges upward and is properly ornamented. A short pipe, *d*, on which the smoke-pipe may be sleeved communicates with the interior of the stove. The front of the stove consists of a plate, E, resting upon the base A, and extending to the diaphragm C, and a plate, F, resting upon said diaphragm and extending to the cap-plate D. The plate E has a large opening, which extends from the base A to within a short distance of the diaphragm C. A grate-front, G, extends across from one side of the opening in front to the other, and with a grate-bottom, H, pivoted on trunnions which pass through the sides of the stove, forms the receptacle for fuel. One of the trunnions is provided with a crank, *h*, by means of which the grate can be tilted, and its contents dumped into the ash-pit below. Said ash-pit contains an ash-pan like a drawer, so that it may be pulled out. The grate-bottom is somewhat shorter than the interior width of the stove, which allows it to be shaken laterally. The hearth may be provided with a fender-rail, I, which extends around in front from one side of the stove to the other. The diaphragm C forms the upper limit of the combustion-chamber.

The segmental opening before mentioned is of sufficient size to allow the passage of all the products of combustion, and yet sufficiently small that the heated gases may be retained long enough in the combustion-chamber to impart the maximum of heat to the tubes which form its back and ends, and still not be expelled through the front opening of the stove. The inclosed space between the diaphragm C and cap D forms a smoke-chamber and radiator, where the heated gases are again con-

fined to impart their remaining heat to the surrounding tubes. The tubes B, however, in their construction, position, and operation, form the essential feature of my stove. Being continuously open throughout their length, the air from the surrounding apartment rushes in at the bottom, and is expelled in a highly-heated condition from the top. The longer the tubes to a certain limit the greater, of course, will be the draft through them, and these tubes, or a portion of them, may be continued to the room or rooms above. The rapid passage of the air preserves them absolutely from burning, and the circular forms give the greatest possible amount of surface in a given space.

In the drawing those tubes which form the four corners of the stove are larger than the others. The diameter of the tubes, however, is not material. They should be of sufficient size only to be fully heated, and not too large to render the stove cumbersome.

Having thus described my invention, and explained some of its advantages, and having two other applications for patents now pend-

ing before the office, and intending in one of them to make a broader claim for the tubular feature herein presented, what I claim as new, and desire to secure by Letters Patent, is—

1. In an open stove, the combination of a series of vertical contiguous tubes, which have a rib on one side and a depression on the other, are open only to the exterior surrounding air, and form the back and sides of said stoves, substantially as described and shown.

2. In an open stove, the combination of the combustion-chamber with a radiating-chamber placed immediately above it, the back and sides of said chamber being composed of separate contiguous tubes, which have a rib on one side and a depression on the other, and air-passages extending continuously through said tubes from the bottom to the top, substantially as described.

This specification signed and witnessed this 12th day of June, 1874.

MARK A. CUSHING.

Witnesses:

FRED. L. FAKE,
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