(No Model.)

S. D. VOSE.

HEATING STOVE.

No. 305,411. Patented Sept. 16, 1884.

Fig. 1.

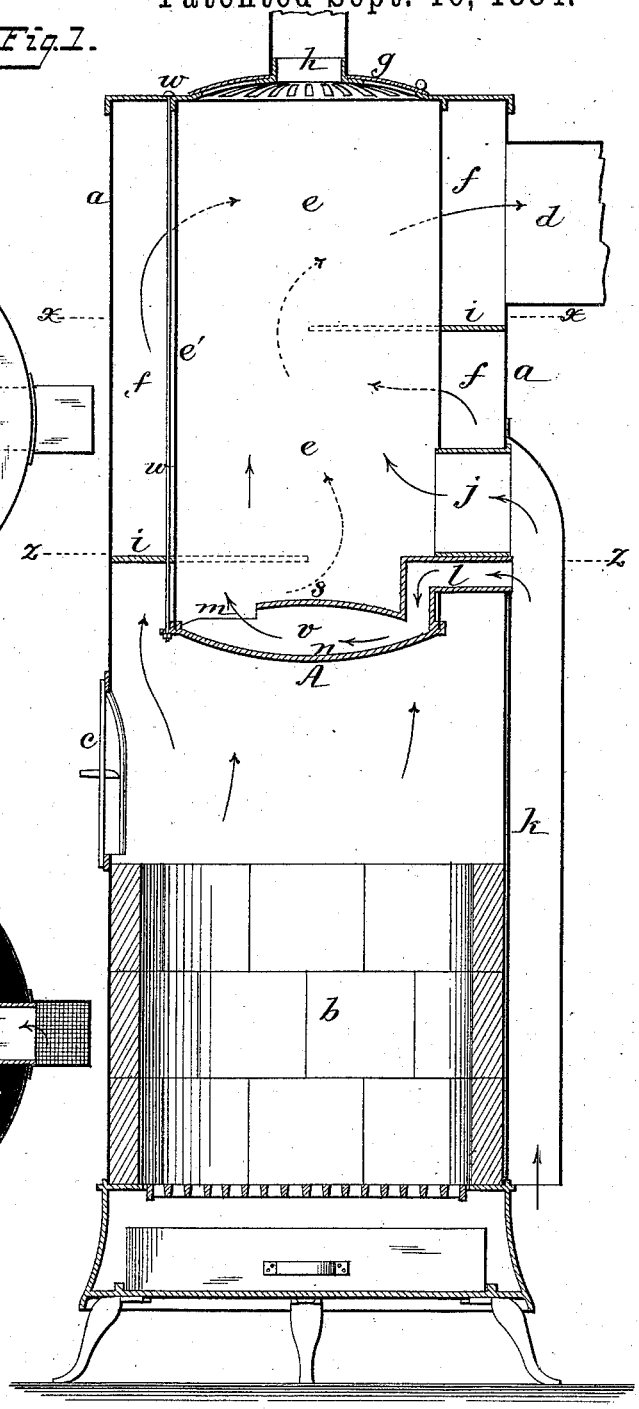


Fig. 2.

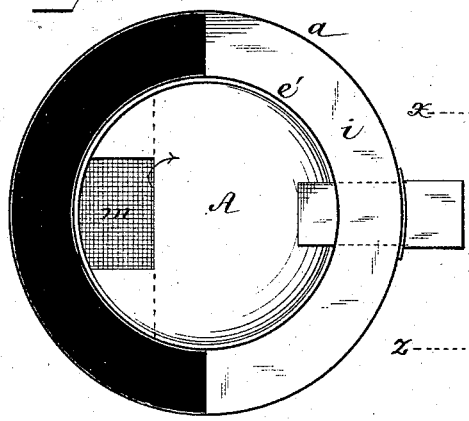
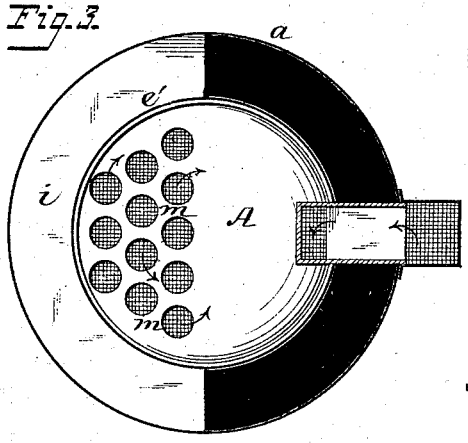


Fig. 3.



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UNITED STATES PATENT OFFICE.

SAMUEL D. VOSE, OF MILWAUKEE, WISCONSIN.

HEATING-STOVE.

SPECIFICATION forming part of Letters Patent No. 305,411, dated September 16, 1884.

Application filed December 31, 1883. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL DAVENPORT VOSE, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Heating-Stoves, of which the following is a specification.

My invention relates to improvements in heating-stoves in which a top air-heating chamber depends within the combustion and radiating chamber; and the objects of my improvements are to provide for detaining the air to be heated within the bottom of said chamber for the purpose of preventing the too rapid destruction of the bottom plate thereof by the heat, and to detain the flame and fire products in their passage around the depending air-heating chamber, so that while a current of cold air enters and circulates in direct contact with the bottom plate of said chamber to absorb heat therefrom before entering the latter, a large volume of air enters said chamber above the detaining bottom chamber, and is highly heated by the action of an obstructed fire-flue around said depending chamber. The detention of the flame around the outside of the depending chamber not only secures a very hot interior heat-imparting cylinder, but has a like effect on the outer casing, thereby increasing the radiation of the outside as well as the inside wall of the fire-flue. The air-retaining chamber is preferably formed of a casting adapted to form the bottom of the depending chamber, and the cold air is caused to impinge directly upon the bottom plate, and is thus rendered effective in preserving it from the destructive effects of the fire. This provision for increasing the durability of the air-heating chamber, while increasing the heat of the air, is of great importance, because such durability insures the purity of the air to be used in warming apartments.

Referring to the accompanying drawings, Figure 1 represents a vertical section of an air-heating stove embracing my improvements; Fig. 2, a horizontal section taken on the line *x x*, and Fig. 3 a similar section taken on the line *z z* of Fig. 1.

I have shown my improvements applied to a very common and cheap form of sheet-iron stove in which the case *a* is preferably of cylindrical form, with a brick-lined fire-pot, *b*, side feed-door, *c*, and top smoke-pipe, *d*, with base-draft; but any suitable form of stove may be used.

The air-heating chamber *e* is preferably of sheet-iron, suspended from the top of the case so that its bottom will be a suitable distance above the feed-door, and leaving a flue-space, *f*, surrounding its vertical wall, so that it will be enveloped by the heat and products of combustion passing off by the top smoke-pipe. The top of the stove is preferably of cast-iron, to which the top of the air-heating chamber is secured with a tight joint, formed in any suitable manner. The top of the air-heating chamber is also preferably of cast-iron, provided with a register, *g*, and having a central collar, *h*, for a hot-air conducting-pipe. The surrounding flue-space *f* is divided by two or more horizontal semicircular partitions, *i i*, placed one near the bottom of the air-heating chamber *e* on one side thereof, and the other on the opposite side just below the smoke-pipe, so as to cause the products of combustion and the escaping heat to be partially retained around the depending chamber by diverting the direct draft between the partitions *i i*, and thereby obtain very complete radiation of the heat both inward and outward at the upper portion of the stove.

The air to be heated is introduced into the depending chamber *e* by a side opening, *j*, near its bottom, which communicates with an outside cold-air inlet-pipe, *k*, which may extend to the bottom of the stove, or outside the apartment; but the air thus introduced will, upon entering the chamber, rise at once, and therefore will not be retained in contact with the lower hottest bottom plate of the chamber.

To utilize the hottest part of the depending chamber for the purpose of giving a high heat to the incoming air, the bottom thereof is formed of a chambered casting, A, having a grooved circumferential rim, by which it is made to form a tight joining with the sheet-iron cylinder *e'*, and having a side opening, *l*, which communicates with the outside cold-air inlet-pipe *k*, just below the cold-air inlet *j* to the depending chamber. The top S of the chambered casting is preferably open at *m*, around the side farthest from the cold-air inlet *l*, so that the air entering this bottom chamber, *v*, is caused to pass in contact with the

bottom plate, *n*, and to circulate within this hot bottom space, *v*, before it passes into the main heating-chamber *e*. This bottom chambered casting greatly increases the air-heating capacity of a comparatively small air-heating chamber, and by confining the comparatively cool incoming air in direct contact with the bottom plate, *n*, of the depending air-heating chamber the bottom plate is thereby caused to last much longer, because the heat absorbed by the direct contact of the incoming air with said bottom plate, *n*, tends greatly to prevent the burning out of this bottom plate, which receives the greatest heat from the combustion-chamber.

The cold-air inlet *l* may have the form of on elbow, as shown, so that the air entering it will be deflected downward upon the bottom plate, *n*, and thus caused to pass across to the opening *m* before it can enter the chamber *e*, as shown by the arrows, while at the same time air entering said chamber *e* above the chambered casting will pass directly upward in said chamber *e*, and thus supply a volume of highly-heated air from the bottom confining-chamber, *v*, the top plate, *s*, whereof may be perforated; but I prefer to form it with the opening *m* at the side opposite to the inlet *l*, as shown.

The register *g* may be opened to let the hot air into the room in which the stove is placed. Any suitable provision may be made for cleaning out the ashes collecting upon the semicircular partitions.

The bottom chamber-casting may be of any suitable form, and its elbow-shaped inlet is preferably integral with the casting, which may be properly supported from the top of the stove by bolts *w*, or in any suitable way.

The air-inlet may be on a level with the bottom of the chamber *v*, and the elbow or drop form is only to enable the manufacturer to make a circular iron chamber that will surround the flanges of the bottom and make a close fit, and also to afford the means of making a connection with the air-inlet and the chamber *e* by means of two joining-castings, which complete the air-passage, one of said castings being riveted to the depending chamber, and the other to the outside joining-casing.

The air-inlet *j* is about three times the capacity of the inlet to the bottom chamber, *v*, so as to admit a larger volume of air into the chamber *e* than enters the bottom space.

While I have shown and described the air entering the heating and supplying chamber in unequal separate volumes through the side openings, *j l*, it will be understood that were it not for the retaining top plate, *s*, of the bottom chamber the air would absorb comparatively little heat from the bottom plate, *n*, because it would rise at once on its entrance into the chamber, and would thereby lose a large amount of the heat.

I claim—

1. In combination, in a heating-stove, the cylinder *e*, having the air-inlet *j*, and the bottom chambered casting, A, having the air inlet *l* and outlet *m*, and the outer stove-shell, *a*, surrounding said clyinder and bottom casting, the said air-inlets opening into the same cold-air pipe at the side of the stove-shell, and the air being heated in separate volumes, as shown and described.

2. The depending cylinder forming the air heating and supplying chamber *e*, having the side air-inlet, *j*, combined with a chambered casting, A, adapted to form the bottom of the cylinder-chamber *e*, having a side air-inlet, *l*, and an air-outlet opening, *m*, in its top plate, *s*, at its side within the chamber *e*, opposite to the air-inlet, and a suitable inclosing-case forming the combustion-chamber and radiator, substantially as shown and described.

3. In a heating-stove, the chambered casting A, having the side elbow air-inlet, *l*, the chamber *v*, and the top opening, *m*, in combination with the cylinder-chamber *e*, having its bottom closed by said chambered casting, and a side air-inlet, *j*, just above the latter, of greater area than the inlet *l*, whereby the air entering at *l* is deflected downward in its passage through the chamber *v*, substantially as described.

4. The combination, in a heating-stove, of the cylinder forming the air heating and supplying chamber *e*, having the side air-inlet, *j*, a top register, *g*, and collared opening *h*, with the chambered casting A, having the side air-inlet, *l*, and an open top plate, *s*, the inclosing-case *a*, the semicircular partitions *i i*, and the air-conduit *k*, all constructed substantially as described.

5. The combination, in a heating-stove, of the depending air-heating cylinder having the side air-inlet, *j*, with the bottom chambered casting, A, having the side inlet, *l*, the inclosing-case, and the semicircular partitions *i i*, substantially as described, for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

SAML. D. VOSE.

Witnesses:
JOHN KEAYS,
FLETCHER VOSBURGH.