H. M. SMITH.

STOVE.

No. 188,973. Patented March 27, 1877.

FIG. 1.

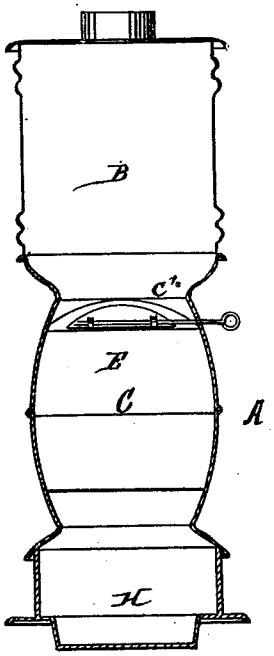
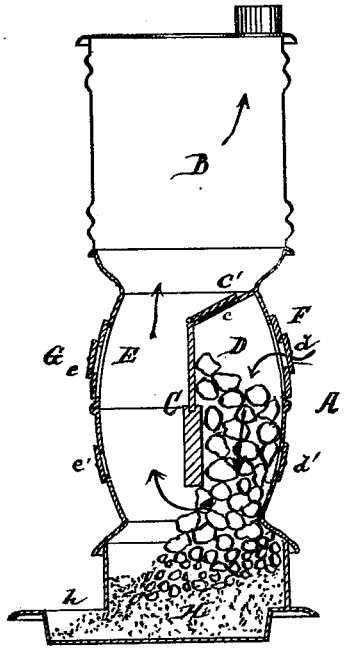


FIG. 2.



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UNITED STATES PATENT OFFICE.

HORATIO M. SMITH, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN STOVES.

Specification forming part of Letters Patent No. **188,973**, dated March 27, 1877; application filed February 16, 1876.

To all whom it may concern:

Be it known that I, HORATIO M. SMITH, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Stoves, of which the following is a specification:

My object in the present invention has been to make a heating-stove which should combine in its construction a special adaptability to the burning of bituminous coal with the advantages incidental to the use of fuel-magazines in stoves.

Its nature will be fully understood from the subjoined description and the accompanying drawing, in which drawing—

Figure 1 is a central vertical section on a plane from side to side, and Fig. 2 a central vertical section on a plane from front to rear, of my improved stove.

Like letters used in said drawing indicate like parts in both figures.

In said drawing, A represents the body of the stove, or that portion thereof designed to contain the fire. B is a heating-drum of ordinary construction, placed on top of the stove. C is a diaphragm, so placed in the stove A as to divide it into two parts or chambers, one of which, D, is designed for the fuel-chamber, and the other, E, for the flame or heat chamber. The upper end, C′, of this diaphragm extends or is turned over to form a close cover to the chamber D. Its lower end descends sufficiently far to form a throat between it and the bottom of the stove, (or the grate, if one is used,) which may be kept filled with fuel. That part of the diaphragm which is exposed to the most intense heat of the fire is made of refractory material, and preferably thicker than the other parts, as shown in the drawing, in order that it may the better withstand the effect of the heat. I have found that tile of fire-clay or steatite answers the purpose well.

The chamber D is provided with a door, F, through which the fuel is fed. In this door a regulable draft-opening, *d*, is inserted, and also at a point lower down, and about opposite the bottom of the diaphragm, is another regulable draft-opening, *d′*. The other chamber, E, is likewise provided with draft-openings *e* and *e′*, and a door, G, at about the same relative positions as those in chamber D. The ash-pit is marked H, and has a mouth, *h*, through which the ashes can be removed.

No grate is shown in the drawing, and, in practice, none is necessary, though one may be inserted, if desired, to act as a sifter for the ashes. The top part of the diaphragm C′, which forms the cover to chamber D, is pierced, as shown in the drawing, and a damper, *c*, applied to close the opening. The smoke-pipe opening out of the drum is designated by the letter I.

It will be noticed from the description thus far given that the draft may be led directly from the fuel-chamber into the drum, and from thence out by opening the damper *c*, (which should be large enough to carry off the smoke,) and taking the air from the draft-opening *d′*, or from chamber E; also, that by closing said damper and admitting the air at *d*, the draft will be forced to take the tortuous course indicated in the drawing by arrows—viz., downward through chamber D, under the diaphragm, and thence up and out through chamber E and drum B.

The chamber D may be kept filled with fuel up to the level of the door-opening, and thus that chamber becomes the fuel-magazine of the stove. By keeping it filled to any point above the bottom of the diaphragm, the throat under the diaphragm is at all times choked with a body of live coals, through the interstices between which the draft will find passage. This point will be the hottest part of the fire, and here the gases evolved from the freshly-igniting coal in the rear, mingled with the air from the draft-opening *d*, will be carried and consumed.

In practice it may be advisable to use the direct draft through the damper *c* for a short time while starting the fire. It may also be used while replenishing the fuel, if desired.

The openings in chamber E are designed to be used when it is desired to cool or retard the fire, and for spy-holes or light. The lower draft-opening *d′* may be used to quicken or regulate more perfectly the burning. It may also be employed with the direct draft through damper *c*, as already mentioned, and so may the opening *e′*.

I have found that it is often desirable to

keep the ash-pit partially filled with ashes or other refractory material, to prevent excessive heating of the bottom of the stove.

Although my improvement is capable of use in stoves of various shapes, the particular contour shown in the drawing has one peculiar advantage—viz., that the inwardly-sloping sides afford a support for the diaphragm.

It will be noticed that the fuel chamber or magazine is formed in the side of the fire-pot of the stove, where it is easy of access, both for putting in fuel and for poking; also, that about two-thirds of the surface of said chamber is exposed to the outer air, and that only about one-third of its lower end is in the fire, while, in the ordinary construction, the entire lower part of the magazine is surrounded and enveloped by the intensest heat; also, that if the fuel in it should become coked, the heat generated thereby is not lost, but is radiated out into the room, and no harm is done to the magazine; also, that by my construction the gases generated in the magazine are carried off, and do not escape into the room. In all these respects my improved stove has great advantages over the ordinary form of stove, in which the magazine is placed in the center and immediately over the fire.

It will be noticed that by taking the draft of fresh air through the unignited fuel the latter is kept cool and its too rapid combustion prevented.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The grateless fuel-chamber A, in combination with the dividing partition or diaphragm C C′, and the opening to admit draft through the fuel to the fire, substantially as specified.

2. The combination, with the grateless fuel-chamber A, divided by the diaphragm C C′, of the doors F G and draft-openings, substantially as specified.

3. The combination, with the grateless fuel-chamber A and diaphragm C C′, of the draft-opening *c* in the upper part of said diaphragm, substantially as specified.

HORATIO M. SMITH.

Witnesses:

EDW. S. EVARTS,

JOHN W. MUNDAY.