J. Q. C. SEARLE.

Magazine Stove.

No. 98,806. Patented Jan. 11, 1870.

Fig. 1,

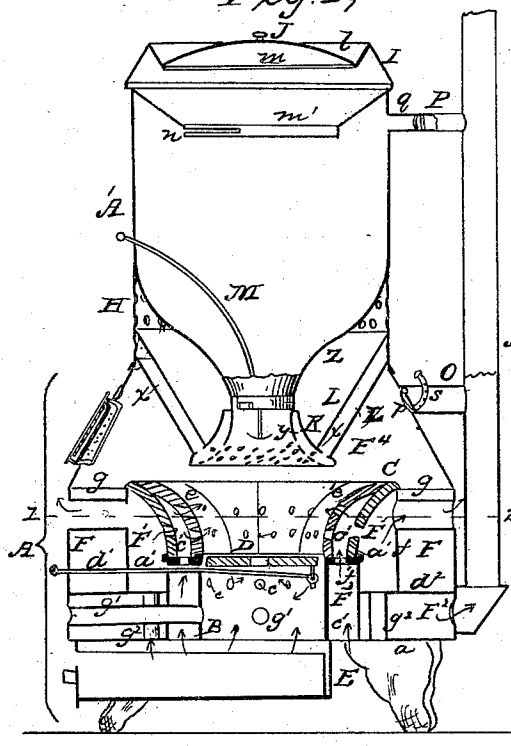


Fig. 6,

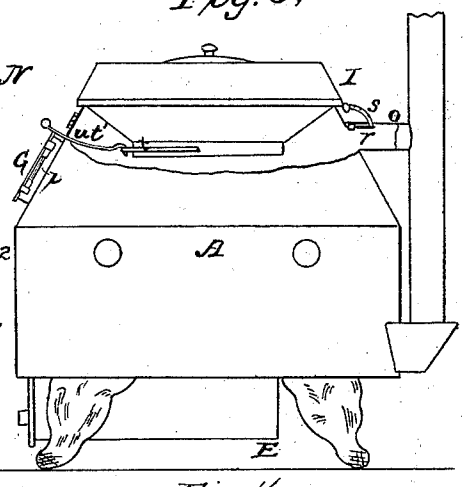


Fig. 2,

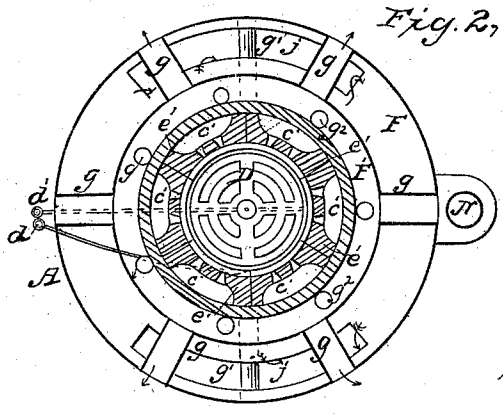


Fig. 4,

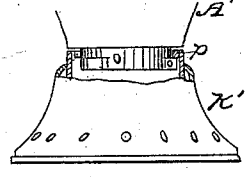


Fig. 3,

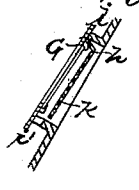
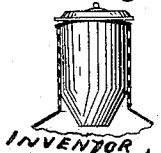


Fig. 5,



WITNESSES

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UNITED STATES PATENT OFFICE.

J. Q. C. SEARLE, OF TOPEKA, KANSAS.

IMPROVEMENT IN BASE-BURNING STOVES.

Specification forming part of Letters Patent No. **98,806**, dated January 11, 1870.

To all whom it may concern:

Be it known that I, J. Q. C. SEARLE, of Topeka, county of Shawnee, State of Kansas, have invented certain Improvements in Stoves, of which the following is a specification:

My invention consists in a certain improvement in magazine-stoves, whereby the supply of coal while stored in the magazine, and while in the act of passing from the latter, is prevented from becoming heated; also, of certain air passages or chambers, so arranged as to introduce a plentiful supply of air among the products of combustion, and insure a thorough heating of the external plates of the stove, and of the air which passes through the stove; and my invention further consists in so constructing a stove that by detaching certain parts a stove of a different character is produced, the necessity of having two sets of patterns for two different kinds of stoves being thus avoided.

Figure 1 is a sectional elevation of my improved stove; Fig. 2, a sectional plan on the line 1 2, Fig. 1; Figs. 3 and 4, detached views of different parts of the stove drawn to an enlarged scale; Fig. 5, a modification, and Fig. 6 an elevation, partly in section, illustrating a change which may be made by removing the cylinder or body of the stove.

Within the base A of the stove, upon the base-plate *a*, rests a cylinder, B, which has at its upper end a perforated flange, *a'*, and communicates at its lower end with the ash-box E. Upon the flange *a'* of the cylinder B rests a flaring perforated fire-pot, C, within which is a lining consisting of a series of perforated blocks, *e'*, each of which is cut away at the under side to form one or more recesses, *c'*, access being had to these recesses through perforations in the segments in the fire-pot and in the flange *a'*. Into elongated recesses near the upper edge of the cylinder B project the trunnions of a circular grate, D, and to one of these trunnions is connected one end of a rod, *d*, which extends through the outer casing, another rod, d^1, which also extends through the casing, being connected at its inner end to a staple at the under side and rear of the grate, so that the latter may be partially rotated to sift the fire by operating the rod *d*, and may be dumped to discharge the contents of the fire-pot by drawing forward the rod d^1. The base of the stove, below the upper edge of the fire-pot, is divided by a horizontal partition, d^2, and by vertical annular partitions or casings *f f'* into chambers F F^1 F^2 F^3, radiating tubes *g g*, &c., extending from the partition *f*, through the chamber F, to the outer casing, similar tubes g^1 extending through the chamber F^2 from the cylinder B to the outer casing, and vertical tubes g^2 communicating with the chamber F^1, extending to the base-plate *a*. The chamber F^3 communicates through openings with the interior of the cylinder B, and through openings *c* in the base-plate *a*, with the space below the latter. In the plate d^2 are elongated openings *j j*, through which the chamber F communicates with the chamber F^2 above the fire-pot. In the upper portion of the base, which is conical or inclined, and incloses a chamber, F^4, are openings *h*, each of which is surrounded by a frame or flange, *i*, Fig. 3, and to the latter is hinged a door, G, provided with the usual transparent pane of mica or other material. To the inner side of the door is secured a perforated metal box or lining, *k*, which (when the door is closed) fits within the frame *i*, a recess or opening, *i'*, allowing air to pass into the space between the door and its lining. The body or cylinder of the stove consists of a single casing, A', which constitutes the fuel-magazine, and is contracted at the lower end to form a neck, the latter being surrounded by a perforated casing, H, resting on the base, and secured to the casing A'.

At the upper end of the magazine is a casing, I, the top of which is depressed at the center, so as to form an inclined flange, *l*, surrounding the feed-opening *m*, the latter being covered by a cap, J. In the bottom of the casing I, which is conical or funnel-shaped, is an opening, *m'*, having at the edge a flange, and on one side of the latter is a slot, *n*, for a purpose described hereafter.

On the neck of the magazine are lugs *o* adapted to recesses in a flange, *p*, at the upper edge of a bell-shaped detachable box or feeder, K, Fig. 4, so that the latter can be connected to the magazine by first raising it to permit the lugs *o* to pass through the recesses in the flange, and then turning it slightly, so as to bring the unbroken parts of the flange above the lugs. In the inner side of the feeder,

near its lower edge, are numerous perforations, and from the casing H to the feeder extend parallel conical plates L L inclosing a chamber, *x*, which communicates through suitable openings with the chamber *y* within the feeder. The enlargement of the magazine A′ above the feeder forms, between the body of the magazine and the plate L, an air-space or chamber, Z, the object of which will be described hereafter.

A curved rod, M, extends through an opening in one side of the magazine, through the neck of the same, and into the feeder, and is provided at its lower end with radiating fingers, which, when the rod is agitated, serve to dislodge the fuel, should the latter become wedged within the neck.

The smoke pipe or flue N communicates at its lower end with the chamber F^2, and, through the lateral branches O P, with the chamber F^4, above the fire-pot, and with the upper part of the magazine. The pipe P is provided with an ordinary damper, *q*, and the pipe *o* with a valve, *r*, hinged at its upper edge, and to which is jointed a curved bar, *s*, teeth or serrations at one edge of the latter catching on the edge of the pipe, and retaining the valve in any position to which it may be adjusted.

The magazine A′ is filled with fuel, and a fire is kindled in the fire-pot, the valve *r* being opened to permit the passage of smoke, until the coal is ignited, when it is closed. The heated gases and products of combustion pass downward through the chamber F close to the exterior casing of the stove, through the openings *j j*, to the chamber F^2, and thence to the flue N, and, being brought into close contact with almost every portion of the outer casing of the base, thoroughly heat the latter.

The fuel in the fire-pot is plentifully supplied with air, a portion of which passes into the cylinder B, both from the ash-pit and through the openings *c* and tubes g^1, another portion passing in fine streams through the perforated lining *e′* from the recesses *c′*, which are supplied from the chambers F^1 and F^2.

Independently of the aid afforded in effecting a thorough combustion of the contents of the fire-pot, the air which is thus caused to circulate through and around the fire-pot maintains the latter at such a low temperature that it cannot burn away, while that portion of the air which does not pass into the fire-pot is heated by its contact with the latter and with the heated casings, and is discharged in this state through the tubes *g* into the apartment.

Owing to the peculiar shape of the feeder its mouth presents an extensive perforated surface, which is so nearly horizontal that a large volume of air is discharged directly downward among the heated gases issuing from the fire-pot, and as these gases pass in the chamber F^4 they are met by the air which enters through the perforated linings *k* of the doors, such a plentiful supply of oxygen being thus furnished to the heated products of combustion as to effect their thorough consumption within the base of the stove, and before they can pass into the chimney.

In supplying a fire-pot with fuel from a reservoir the coal within the mouth of the reservoir is very apt to become heated and coked before or as it passes from the reservoir, and before it reaches the fire-pot, this being especially the case when burning soft or bituminous coal, which cokes at a very low heat.

I have found that a plentiful supply of air introduced among the particles of coal as they pass from the feeder to the fire-pot will effectually prevent the coking of the fuel. In the present instance the air, passing through the perforated casing H and into the hollow feeder K, is not only thrown directly downward onto the surface of the fire, as before described, but is also distributed among the particles of coal as they pass from the feeder to the fire-pot, the coal both within and directly below the mouth of the feeder being thus prevented from becoming unduly heated.

The inclined plates L L, which serve to conduct the air to the feeder, extend almost to the lower edge of the latter, so as to prevent the heated gases from rising into contact with any other part of the reservoir, the neck of the latter and its contents being maintained at a low temperature by the air of the apartment, which circulates freely in the space or chamber Z in direct contact with the reservoir.

It will be seen that the casing H serves to support the magazine, and imparts a more finished appearance to the stove without preventing the free access of air to the chamber Z. This casing may be, however, dispensed with, as may also one of the plates or partitions L, and the plate or partition may be formed by extending the feeder outward to the casing of the stove.

Inasmuch as the entire upper portion or cylinder of the stove is used as a fuel-magazine, the frequent replenishing of the stove with fuel is avoided, while by dispensing with the ordinary double casings and flues in this part of the stove for the passage of either heated air or gases, the cost of manufacturing the stove is greatly reduced, and its magazine is exposed so directly to the air of the apartment that it cannot become unduly heated.

It will be apparent that the same results may be obtained when a detachable magazine is fitted in an outer stationary casing, which may be perforated, as shown in Fig. 6. Other means than those described may be used for discharging air among the particles of fuel as they leave the feeder, and the latter may be solid instead of hollow, and may form a permanent instead of being a detachable part, of the magazine. I prefer, however, to make it detachable, as the parts of the stove may then be more readily fitted together. The pipe P prevents the escape of any vapor which may arise from the introduction of the fuel in a moist state into the magazine, and the flange

l surrounding the feed-opening prevents particles of coal, when the reservoir is being replenished, from lodging on the top of the stove or falling upon the floor. The passage of currents of air upward from below the base-plate through the pipes g^2 and chamber F, and, laterally, out of the pipes *g*, not only accomplishes the purpose before mentioned, but also maintains a thorough circulation of air within the apartment. Owing to the curved and tapering form of the neck of the magazine the coal can pass freely downward without lodging or becoming packed in its place.

A stove of a different character may be produced by removing the magazine A′ and its plates L L, and fitting the casing I to the base, as shown in Fig. 6. By this means the expense of constructing two sets of patterns for two different kinds of stoves is avoided. When the casing I is fitted to the base a slide, *t*, should be introduced into the slot *n*, and a rod, *t′*, passed through an opening, *u*, in the base and hooked to the slide, which serves to close the opening *m′*, and to support a supply of fuel until the cap J is in its place, when it may be drawn forward to discharge the fuel into the fire, the passage of gases into the apartment during the introduction of fuel to the stove being thus prevented.

I do not here make any claim to the rod M, as it may form the subject of a future application for Letters Patent.

I claim—

1. A magazine-stove, in which the upper portion of the outer casing of the stove is secured directly to or in contact with the casing of the magazine.

2. A plate or partition, L, extending from the mouth of the magazine or feeder, so as to prevent the heated air or gases from passing in contact with the entire outer side of the feeder.

3. An air-chamber, Z, around the contracted lower end of a magazine.

4. A hollow perforated feeder suspended above a fire-pot and expanded at the lower end, so as to present an extended perforated surface for the passage of currents of air directly onto the fire.

5. The combination of a magazine contracted at its lower end, a plate or plates, L, and a detachable flaring feeder.

6. A magazine, the lower end of which is contracted and curved, substantially as set forth.

7. A cylinder, B, arranged within the base of a reservoir-stove, and having at its upper end a perforated flange, *a′*, supporting a fire-pot, and a recessed and perforated lining.

8. The arrangement, within the base of the stove, of the fire-pot, the chambers F F^1 F^2 F^3, and the air passages or tubes *g* g^1 g^2, substantially as set forth.

9. A fire-pot lining consisting of detachable recessed and perforated sections *e′*, constructed and arranged within a fire-pot, as specified.

10. The combination, with a fire-pot, of a chamber, F^1, through which air can pass between the pot and an outer flue or chamber for the passage of heated gases.

11. The combination, with a grate, D, of an agitating-rod, *d*, and a dumping-rod, d^1, connected to the grate, and operating as described.

12. A stove-base, A, cylinder A′, and casing I, constructed and adapted to each other, substantially as described, so that when the cylinder is removed the casing may be applied to and form a cap for the base.

13. The combination, with a stove, of a shallow casing or hopper, I, having a cap, J, and a slide, *n*, or its equivalent.

14. The perforated casing H extending between the base of the stove and the enlarged part of the reservoir.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

J. Q. C. SEARLE.

Witnesses:

CHARLES E. FOSTER,

EDM. F. BROWN.