A. C. RAND.

Base-Burning Stove.

No. 129,365. Patented July 16, 1872.

Fig. 1.

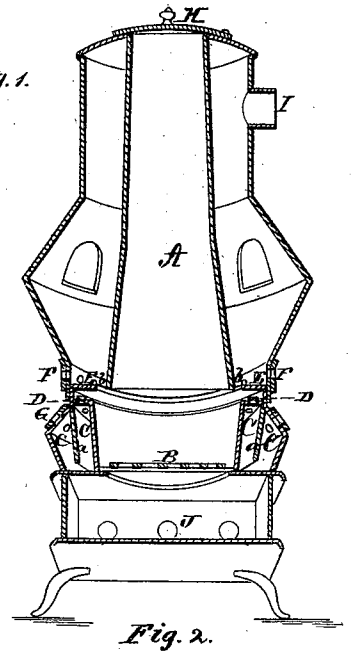
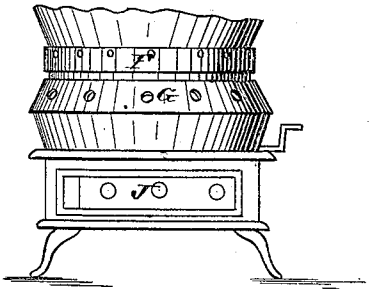


Fig. 2.



Witnesses:

Henry N. Miller

C. L. Ewert.

Inventor.

Alonzo C. Rand.

per Alexander Mason

Attorneys.

UNITED STATES PATENT OFFICE.

ALONZO C. RAND, OF AURORA, ILLINOIS.

IMPROVEMENT IN BASE-BURNING STOVES.

Specification forming part of Letters Patent No. 129,365, dated July 16, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that I, ALONZO C. RAND, of the city of Aurora, county of Kane and State of Illinois, have invented a certain new and useful Improvement in the Construction of Furnaces and Stoves, of which the following is a specification:

This invention relates to certain improvements in furnaces and stoves so as to insure the perfect combustion of bituminous or other coals; and consists in the arrangement of a hot-air chamber, which is made to form the interior side portion of the fire-box; also the use of a deflector placed over the outlet-tubes in the hot-air box, so as to force or deflect the air in a right angle into the gas as it makes its exit from the bottom of the magazine.

A represents a magazine within the ordinary form of a stove, and has its base or lowest end quite near the grate B, the space between grate and magazine always being the same in height as the depth of the hot-air box or chamber C, which forms the side of the fire-box. D D D are the nipples cast with the hot-air box, out of which the air issues and comes into contact with the deflector E. This deflector is placed over the nipples, and in a line with the bottom of the magazine. *a* is a partition in the hot-air box, extending from the top nearly to the bottom of the box. *b* is the space between the bottom of the magazine and the edge of the deflector, through which space the gas-flame passes. F is a damper, encircling the stove above the line of the deflector, and regulates the admission of air above the deflector. G is another damper, and regulates the admission of air into the hot-air box. H is the cover to the magazine, and is made tight by a ground joint. I is an ordinary draught-pipe. J is a lower damper.

The operation of this invention is as follows: A fire is kindled by letting the kindlings drop through the hole covered by H. Then the magazine is filled with coal and the cover replaced. A fire is introduced beneath the grate, both upper dampers closed, and the lower one, J, opened. After the fire is well going, the lower damper is closed and the damper G opened. The flame passing through the space *b* follows up the sides of the magazine, and very soon the coal commences to vaporize. The vapor and gas, having no other exit than the bottom of the magazine, are compelled to pass downward through the incandescent coke at the base of the magazine; thence through the space *b*, where they are brought into most intimate contact with the now heated air, which is forced into the flame by the deflector E. The incandescent coke overlying the grate, and extending a little way into the magazine, is gradually decomposed, and is fed or pressed downward by the mass of coal above it, so that the space between the bottom of magazine and grate is always supplied with coke in state of combustion. This, in contact with the hot-air box, heats the air, so that the air deflected into the flame is always hot, and therefore the union of the oxygen and carbon is accelerated and the combustion more perfect.

The object in having the partition in the hot-air box is that the air, after passing through the inlet-holes, may be conducted downward to the bottom of the box, and thence upward, on the inside of the box, nearest the hot coke.

If it become desirable to subdue the fire, the damper F is opened and the cold air strikes against the magazine and withdraws the heat, thus diminishing the production of gas and vapor in the magazine.

I do not wish to be understood as confining myself to the exact form of magazine, fire-pot, hot-air box, and damper, as they may be varied to suit.

The essential points are converting the coal into gas and vapor in a magazine, and compelling it to pass through the incandescent coke, and then, while in a state of but partial ignition, deflecting the air into most intimate contact with it, most thoroughly accomplishing this by so diminishing the aperture of outlet of flame as to make it absolutely impossible for it to escape without first having a proper amount of air introduced into it to make its perfect combustion certain.

Now, what I claim as my invention is—

1. The combination, in a stove or furnace, of the vertical magazine A, extending from the top of the stove or furnace to the fire-pot, the deflector E, and damper F, all substantially as and for the purposes set forth.

2. The combination of the magazine A, deflector E, and the hot-air box C C, forming the fire-pot, all substantially as and for the purposes set forth.

A. C. RAND.

Witnesses:
A. N. MARR,
JNO. SMITH.