L. BONNELL.

Hot Air Furnace.

No. 110,731. Patented Jan. 3, 1871.

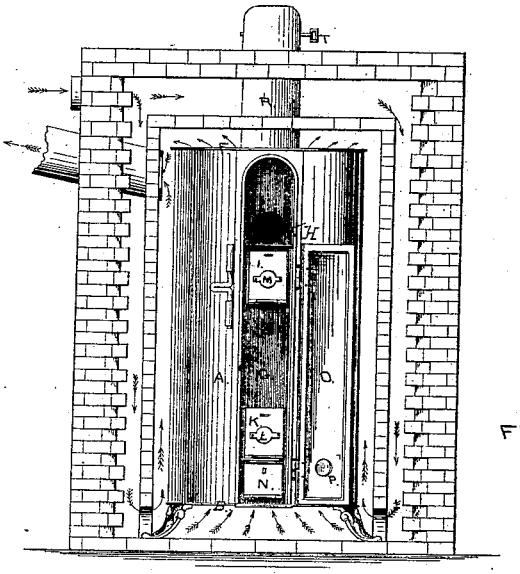

FIG. I.

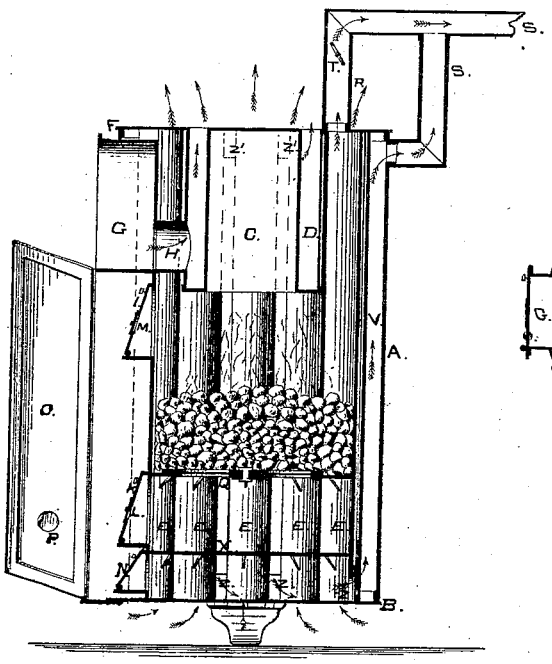

FIG. II.

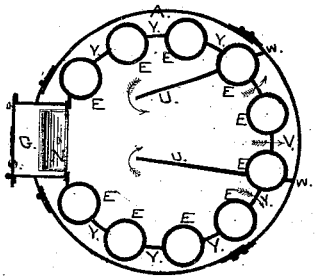

FIG. III.

INVENTOR.

Lansing Bonnell

WITNESSES.

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LANSING BONNELL, OF MILWAUKEE, WISCONSIN.

Letters Patent No. 110,731, dated January 3, 1871.

IMPROVEMENT IN HOT-AIR FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

I, LANSING BONNELL, of Milwaukee, in the county of Milwaukee, in the State of Wisconsin, have invented certain Improvements in Furnaces, of which the following is a specification.

Nature and Object of the Invention.

My invention is a furnace, which it is intended shall economize fuel and be effective in its operation, and this I do by tubes E, with flanges on them, set so as to form a fire-chamber, the flanges being shorter than the tubes, so that the draught will pass over their tops and down their outsides, and in through at the bottom, and pass out through and between guides U U, with a drum in the top of the furnace, forming a large heating-surface.

Description of the Drawing forming part of this Specification.

Figure 1 is a front view of the furnace with a brick setting;

Figure 2 is a vertical sectional view; and

Figure 3 is a cross-sectional view.

General Description.

A is the outside shell of the furnace. It is designed to inclose this furnace in a shell of brick, as shown in fig. 1, or to make it portable by inclosing it in an iron case.

B is the bottom plate of the furnace.

C, inner drum of a cylinder over the fire.

D, the outside of the drum, and between it and the inner drum C is an air-space.

E, the air-tubes, open through the bottom and top of the furnace, with a flange, Y, on each one, which reaches across to the next tube, making a tight fire-chamber.

F, the top plate of the furnace, in the center of which and over the fire, is a heating air-cylinder, C and D.

G, the front of the furnace.

H, cold-air pipe leading to the air-chamber in cylinder C and D.

I, the door through which the fuel is fed to the furnace.

K, ash-pit door.

L, damper in door K.

M, damper in door I.

N, door to the bottom of the furnace.

O, large door to the front of the furnace, and which shuts outside of all the other doors.

P, damper in door O.

Q, the grate.

R, a pipe for direct draught from the fire, which is used when starting the fire.

S, the draught-pipe to be used when the fire has been started and is well going.

T, damper in direct-draught pipe R.

U U drop-guides on the bottom of the furnace.

V, smoke-passage.

W W, flanges out from a couple of the air-tubes to the shell of the furnace, making the smoke-passage.

X, the ash-pit floor.

Y, flanges on the air-tubes, one on each of them, to fill up the space between them, and make the fire-pot.

Z, passage for draught under the flanges Y.

Z', passage over these flanges Y for draught.

These flanges Y are shorter than the air-tubes, both at top and bottom, except the two which form the air-passage V, and these are shorter at the bottom only.

The operation of this furnace is that, being put up with a brick or iron casing, the fuel is put in through door I, and lies on grate Q; the damper in the ash-pit door is left open, as well as the damper in pipe R. This gives a direct and short passage to the chimney.

When the fire has got well under way, then close the damper T, and the draught and heat will pass up over the openings Z', and pass down the outside of air-tubes E, and in through openings Z and around the draught-guides U U, and into passage V, and out through pipe S to the chimney, the cold air passing down the outside of an air-chamber, and up through air-tubes E, thus giving a large amount of heating-surface.

Claims.

I claim as my invention—

1. Draught-guides U U, in combination with air-tubes E, with flanges Y and flanges W W, bottom B, and ash-pit floor X, substantially as described.

2. Drums C and D, in combination with air-tubes E, with flanges Y, substantially as described.

3. Air-tubes E, with flanges Y, substantially as described.

4. Air-tubes E, with openings Z and Z', in combination with bottom B, top F, and ash-pit floor X, substantially as described.

5. A furnace, having tubes E, with openings between them at their tops and bottoms, so that the draught may pass out between them at their top and down their outsides, and in through between them at the bottom, and out again between guides U U, substantially as described.

LANSING BONNELL.

Witnesses:

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