(No Model.) 3 Sheets—Sheet 1.

P. H. SIMS & P. HOHMEIER.

HOT AIR FURNACE.

No. 343,737. Patented June 15, 1886.

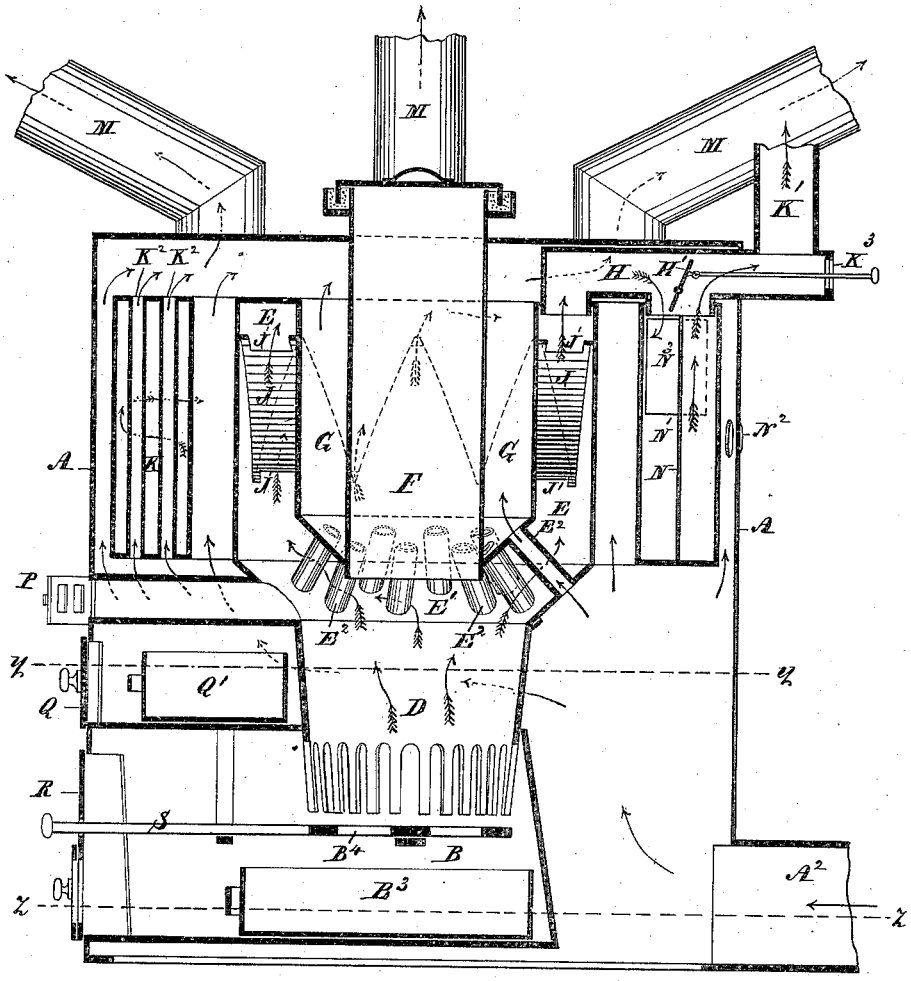

Fig. 1.

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Att'y.

(No Model.) 3 Sheets—Sheet 2.

P. H. SIMS & P. HOHMEIER.

HOT AIR FURNACE.

No. 343,737. Patented June 15, 1886.

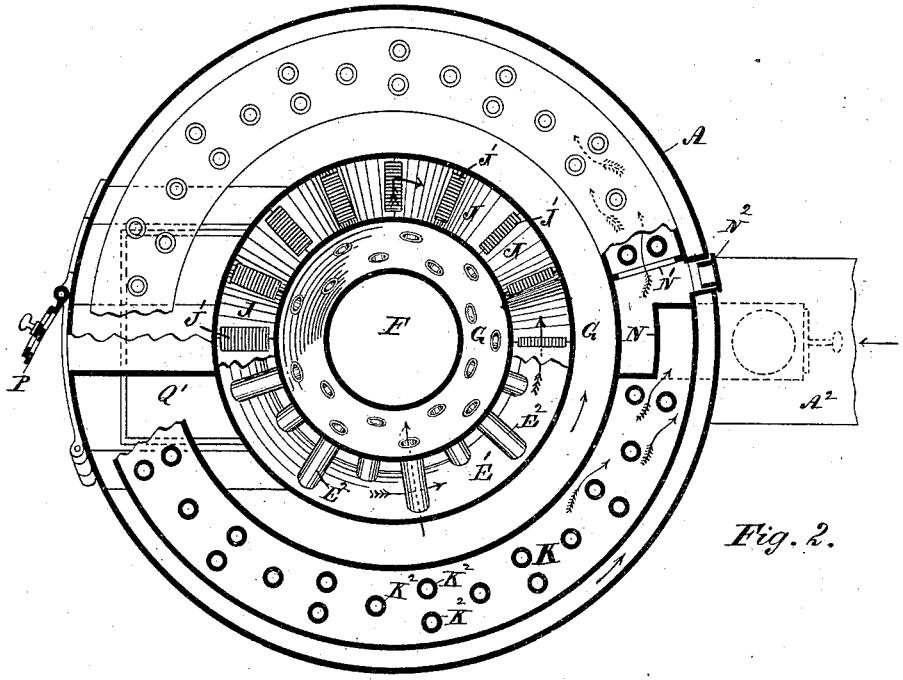

Fig. 2.

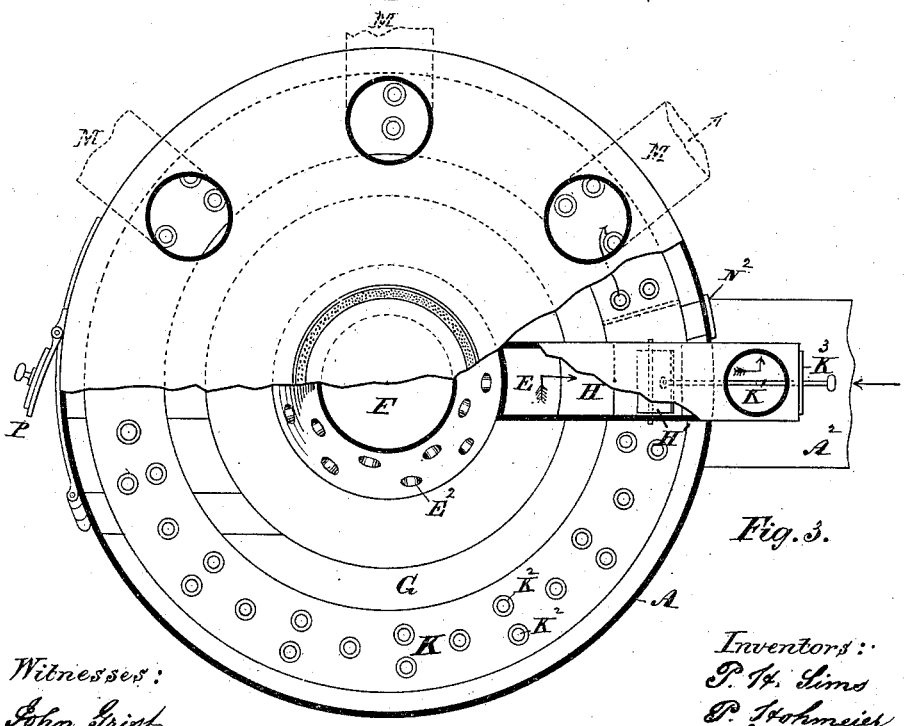

Fig. 3.

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(No Model.) 3 Sheets—Sheet 3.

P. H. SIMS & P. HOHMEIER.

HOT AIR FURNACE.

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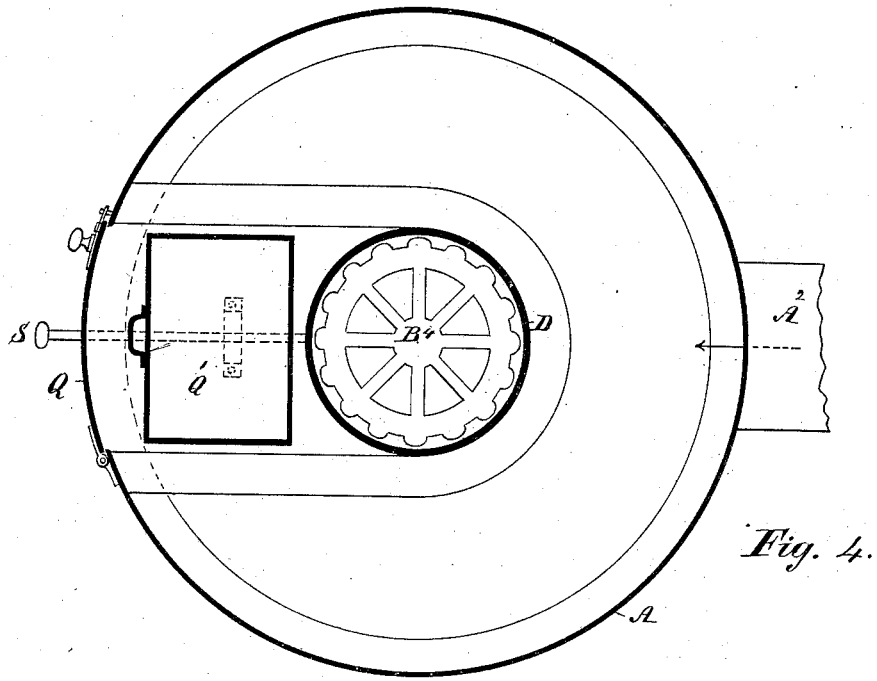

Fig. 4.

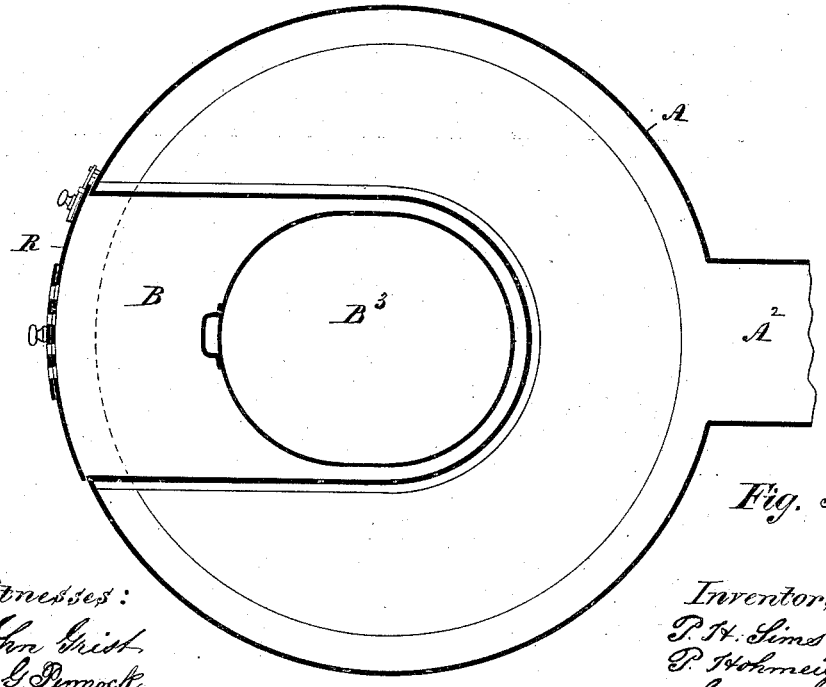

Fig. 5.

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UNITED STATES PATENT OFFICE.

PETER H. SIMS AND PHILIP HOHMEIER, OF WATERLOO, ONTARIO, CANADA.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 343,737, dated June 15, 1886.

Application filed October 1, 1885. Serial No. 178,704. (No model.)

To all whom it may concern:

Be it known that we, PETER H. SIMS and PHILIP HOHMEIER, both of Waterloo, in the county of Waterloo, in the Province of Ontario, in the Dominion of Canada, have jointly invented certain new and useful Improvements in Hot-Air Coal-Furnaces; and we do hereby declare that the following is a full, clear, and exact description of the same.

The object of our invention is to obtain the maximum amount of heat from the minimum consumption of coal, to control the distribution of heat, and to self-feed combustion.

Our invention consists of a furnace having an exterior casing or shell provided with conductor-pipes at top, and centrally a stove with a fire-pot to seat an annular smoke-flue, closed at top and having a funnel-shaped bottom provided with radially-disposed air tubes, and connected by a flue with a concentric smoke-drum having vertical air-tubes, and a magazine supported by the funnel bottom flue, so that the cold air to be heated passes around the fire pot and through the radially-disposed tubes, and through the vertical tubes and around the exterior of the annular flue and concentric drum, and is carried off by the conductor-pipes to the place of distribution. The annular smoke-flue is divided by a zigzag partition flatwise horizontal, having apertures diminishing in size from the front, to equalize the draft and allow floating ashes to fall back into the fire-pot.

Figure 1 is a vertical section of our hot-air furnace. Fig. 2 is a horizontal section on line *x x*, Fig. 1, portions being broken away to show the parts below. Fig. 3 is a top view, a portion of the casing being broken away to show the interior. Fig. 4 is a section on line *y y*, Fig. 1. Fig. 5 is a section on line *z z*, Fig. 1.

Feathered arrows show the course of the smoke and plain arrows that of the air.

A is the outside shell or casing of the furnace; B, the ash fall or pit; B^3, the ash-pan; and B^4, the grate at the bottom of the fire-pot D, which seats within the upper rim of the ash-fall.

A^2 is an air-duct to casing A.

E is an annular smoke-flue having a funnel-shaped lower part, E′, provided with radially-disposed air-tubes E^2. The outer wall of the funnel bears on a flange around the circular edge of the fire pot and the inner wall of the funnel supports the fuel-magazine F, which is concentric to the walls of the flue, to form an annular air-chamber, G, which is open at the top.

The annular smoke-flue E has internally a horizontal zigzag partition, J, having apertures J′ in the angles at top and bottom, decreasing in size from front to rear, to equalize the draft passing through the fire and prevent heavy ashes being carried through duct H into drum K by their falling back into the fire-pot through the apertures.

The flue E is closed at the top, and by the smoke-duct H connects with an annular smoke-drum, K, concentric to flue E. The smoke-duct H leads to the smoke-pipe K′, and is provided with a damper, H′, which closes the aperture into drum K, so that the smoke will pass directly into the smoke-pipe K′ without going through drum K; but when the damper is adjusted vertically smoke will enter the drum, which has a vertical ⌙-shaped partition, N, dividing the entrance and exit, to cause the smoke to travel around the drum and out through pipe K′ into the chimney.

K^3 is a damper at the end of duct H, to regulate the draft.

Drum K is provided with rows of vertical air-tubes K^2, around the outside of which tubes the smoke circulates, and the air to be heated passes through the tubes into the space below the top of casing A, which is provided with any number of pipe-conductors, M, leading to the places of distribution.

N′ is a vertical cross-partition in drum K, near its inlet and outlet, said partition having an opening, N^3, in the upper part to allow the smoke to pass, the lower part forming a dead-air space, into which floating ashes will fall. In the side of the drum and outer casing, A, is a passage closed by a stopper, N^2, for removal of the ashes in the dead-air space.

P is a door, with a damper in the side of casing A, to introduce kindling into the fire-pot and to check the draft through the fire.

Q is a door in the wall of the shell, to admit a water-pan, Q′, in an open chamber, to moisten the air while being heated.

The door R to the ash-pit has dampers to regulate draft to the fire, and a slide, through which passes the handle S of the shaker, which extends from the grate.

We claim as our invention—

1. In a furnace, the combination of a fire-pot, an annular flue, E, funnel-shaped at bottom, connected therewith, closed at top, and provided with radially-disposed air-tubes E^2, and a zigzag partition, J, having apertures J′, diminishing in size from front to rear, an annular drum, K, surrounding said flue E, and having a partition, N, between the inlet and outlet, and a smoke-duct, H, connecting-flue E, drum K, and smoke-pipe K′, and provided with a damper, H′, to close off drum K when required, whereby the smoke, after passing between the air-tubes E^2, enters the annular flue E and passes through apertures J′ in the zigzag partition J, and through the annular drum K and duct H to the chimney, as set forth.

2. In a self-feeding furnace having a casing, A, provided with inlet A^2 and exit-pipes M, the combination, with the fire pot D, of an annular flue, E, closed at top, funnel-shaped at bottom, and provided with radially-disposed air-tubes E^2, an annular drum, K, surrounding flue E, and provided with vertical air-tubes K^2, and a smoke-duct, H, connecting-flue E, drum K, and smoke-pipe K′, whereby air entering the casing at A^2 will be heated by the fire-pot, the annular flue and drum, and their tubes, and be carried off by pipes M, as set forth.

3. In a self-feeding furnace, the combination of a fire-pot, D, magazine F, the annular flue E, consisting of two concentric shells closed at the top, funnel-shaped at bottom, connected with the fire-pot and having a smoke-outlet and provided with radially-disposed air-tubes E^2, and a horizontal zigzag partition, J, having openings J′, diminishing in size from the front toward the smoke-outlet, to distribute the draft through the fire and prevent heavy ashes being carried into drum K, as set forth.

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