

(No Model.)

D. B. WEIGHTMAN.
HOT AIR FURNACE.

No. 546,722.

Patented Sept. 24, 1895.

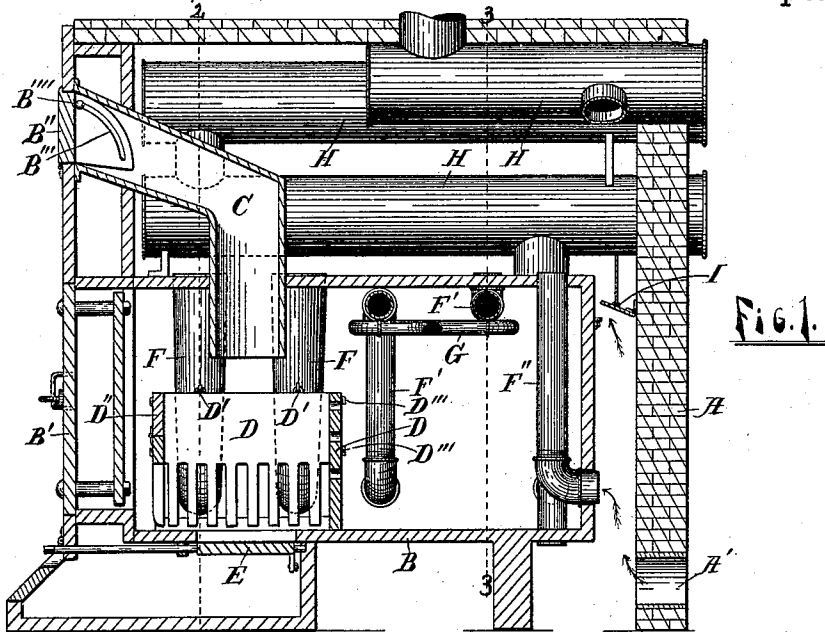


Fig. 1.

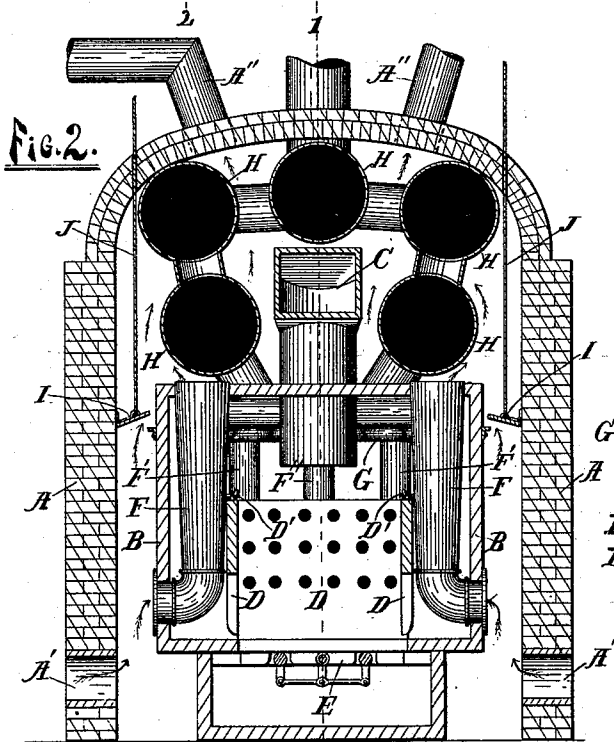


Fig. 2.

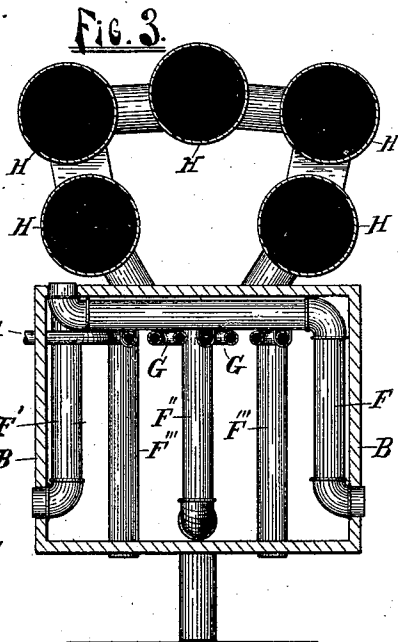


Fig. 3.

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UNITED STATES PATENT OFFICE.

DAVID B. WEIGHTMAN, OF GRAND RAPIDS, MICHIGAN.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 546,722, dated September 24, 1895.

Application filed May 21, 1895. Serial No. 550,082. (No model.)

To all whom it may concern:

Be it known that I, DAVID B. WEIGHTMAN, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Hot-Air Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in hot-air furnaces; and its object is to provide the same with certain new and useful features, hereinafter more fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section on the line 1 1 of Fig. 2; Fig. 2, a transverse vertical section on the line 2 2 of Fig. 1, and Fig. 3 the same on the line 3 3 of Fig. 1.

Like letters refer to like parts in all of the figures.

A represents the brick casing of any convenient construction, having cold-air inlets A' near the bottom at convenient points and hot-air eduction-pipes A'' at the top, arranged as may be convenient.

B is a substantially-rectangular oblong combustion-chamber having an upwardly-extended front provided with a lower door B' to gain access to the fire-pot or to insert soft coal or wood when they are used for fuel.

B'' is an upper door for inserting hard coal, and provided with segmental sides projecting inward at right angles and provided with curved slots B''', engaging stop-pins B'''' to limit the outward movement of said door.

From said door a magazine C extends at a downward and inward inclination, thence turning vertically downward to a point above the fire-pot, which magazine and fire-pot are used when hard coal is burned. Said fire-pot consists of side plates D and end plates D', having fingers at their lower sides. The side plates are secured in place by hooks and eyes D' at their upper edges, by which they are suspended from the air-pipes F, and the end plates are held in place by hooks D''' on the ends of the side plates. The front end plate D'' is horizontally divided and the upper part

made separate from and hinged to the lower part of the same, and can be turned down in front of said lower part to gain freer access to the interior of the fire-pot when the door B' is opened.

E is a grate of any convenient construction beneath the fire-pot and magazine. When the furnace is to be used for wood, these plates D and D', constituting the fire-pot, may be readily removed and the interior of the combustion-chamber will then accommodate long wood, and the grate will admit air beneath the same. To aid in utilizing the heat from the products of combustion and radiation, pipes F extend upward through the combustion-chamber at each side of the fire-pot and open upward through the top of the said chamber at their upper ends and laterally through the sides of the same at their lower ends.

These pipes F also serve to support the sides of the fire-pot, as heretofore described, and are tapered and made larger at their upper ends, whereby the air is allowed to expand as it becomes heated without being caused to move faster. At the rear of the magazine other air-pipes F' open through the sides of the chamber B near the bottom thereof and extend upward and thence across above the fire near the top of the chamber, and thence open upward through the top thereof. Beneath these transverse portions of pipes F' and close to the same is a serpentine coil G for heating water. At the rear of the combustion-chamber are also other vertical air-pipes F'' and F''', passing through the combustion-chamber, having their lower openings near the bottom thereof and upper openings in the top of the same. Above the chamber B and connected therewith are radiating-drums H to further extract the heat from the products of combustion before it finally escapes to the chimney. Between the casing A and the combustion-chamber B and between the intake-openings of the air-pipes F F' F'' F''' and the outlet-openings of the same are a series of dampers or air-gates I, consisting of flaps or plates hinged to said casing at their outer edges, and when closed resting at their inner edges on angle-irons secured to the chamber B. Said dampers I are opened by means of suitable chains or wires J, extending upward through the casing A.

When these gates I are closed, all the air is forced to circulate through the said air-pipes, and when they are open a portion of the air passes upward between the casing A and chamber B. I find it of great advantage to thus check the circulation of air and force it all through said pipes when the fire is low or when the weather is moderate and but little heat is needed. By the described construction I am able to easily and quickly adapt the device for burning hard coal, using the magazine, or soft coal, without the magazine, or to burn long wood by removing the fire-pot. The device is also made very effective, especially with a low fire, by means of the arrangement whereby all the air may be caused to pass through the heating-pipes, or only a portion, at pleasure.

What I claim is—

1. In a hot air furnace, the combination of the casing, having upper and lower doors; a combustion chamber within said casing, said combustion chamber having an open front contiguous to said lower door, whereby it may be supplied directly with wood or soft coal; a magazine leading from said upper door to said combustion chamber; a fire pot, within said combustion chamber and beneath the delivery end of said magazine, said fire pot being removable to adapt the combustion chamber to long wood; and a grate beneath said fire pot, substantially as described.

2. In a hot air furnace, an oblong combustion chamber, having a door at one end, vertical air pipes at each side of said chamber, plates detachably supported by said pipes forming the sides of a fire pot, and plates detachably secured to said side plates, a magazine above said fire pot and a grate beneath the same, substantially as described.

3. In a hot air furnace, an oblong combustion chamber, having a door at one end, a removable fire pot near said door, a magazine above said fire pot, and a grate beneath the same, air pipes at each side of said fire pot opening at the top through the top of the said chamber, and opening at the bottom through the sides of the same, air pipes at the rear of said fire pot opening at one end through the sides of the chamber, extending vertically near the sides of said chamber, thence horizontally near the top of said chamber and thence through the top of the same, and vertical air pipes at the rear of said chamber, substantially as described.

4. In a hot-air furnace, the combination of the casing, having cold air inlets and hot air outlets; a combustion chamber, located within said casing and being of such size relatively thereto as to provide inclosed air passages which partly surround the combustion chamber and are in communication with said air inlets and outlets; air pipes, within said combustion chamber having communication at their tops and bottoms with said air passages, certain of said pipes having transversely extending branches; and water pipes,

within the combustion chamber and adjacent to said branches, substantially as described.

5. In a hot-air furnace, the combination of the casing, having cold-air inlets and hot-air outlets; a combustion chamber, located within said casing and being of such size relatively thereto as to provide inclosed air passages which partly surround the combustion chamber and are in communication with said air inlets and outlets; air pipes within said combustion chamber, each of said air pipes opening at both ends into said passages and certain of them having transversely extending branches; pipes coiled contiguous to said branches; and heating drums, located within the casing and adjacent to said combustion chamber.

6. In a hot-air furnace, the combination of the casing, having cold-air inlets and hot-air outlets; the combustion chamber, located within said casing and being of such size relatively thereto as to provide inclosed air passages partly surrounding said combustion chamber, said air passages being in communication with said air inlets and outlets; air pipes within said combustion chamber, each opening at both ends into said air passages; coiled pipes within the combustion chamber; and dampers for controlling the flow of air through said passages.

7. In a hot-air furnace, the combination of the casing, having cold-air inlets and hot-air outlets; the combustion chamber, located within said casing and being of such size relatively thereto as to provide air-passages partly surrounding the former, said air passages being in communication with said air inlets and outlets; heating drums within said passages; air pipes within the combustion chamber, each opening at both ends into said air-passages; and water-pipes within said combustion chamber.

8. In a hot-air furnace, the combination of the casing, having cold-air inlets and hot-air outlets; the combustion chamber, located within said casing and being of such size relatively thereto as to provide inclosed air-passages partly surrounding the former, said air passages being in communication with said air inlets and outlets; heating drums within said passages; air pipes within the combustion chamber, each opening at both ends into said air-passages; water pipes within said combustion chamber; and dampers within said air passages.

9. In a hot air furnace, a rectilinear fire pot having the front plate horizontally divided and hinged, substantially as described.

10. In a hot air furnace, a combustion chamber, vertical air pipes having their upper ends enlarged and extending through said chamber, and a fire pot in said chamber, having its sides supported by said pipes, substantially as described.

11. In a hot air furnace, a combustion chamber, having an upper and lower door in its front, a fire pot near said lower door, having

its front plate divided and hinged, a magazine extending from the upper door to a point above said fire pot and air pipes supporting the sides of said fire pot, substantially as described.

5 12. A hot air furnace, constructed to burn wood, or soft or hard coal, embodying a combustion chamber having an upper and a lower door in its front; a fire pot within said combustion chamber, said fire pot having its front

contiguous to said lower door and divided horizontally and the two parts hinged together, as set forth, and a magazine leading from said upper door to said fire pot.

In testimony whereof I affix my signature 15 in presence of two witnesses.

DAVID B. WEIGHTMAN.

Witnesses:

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