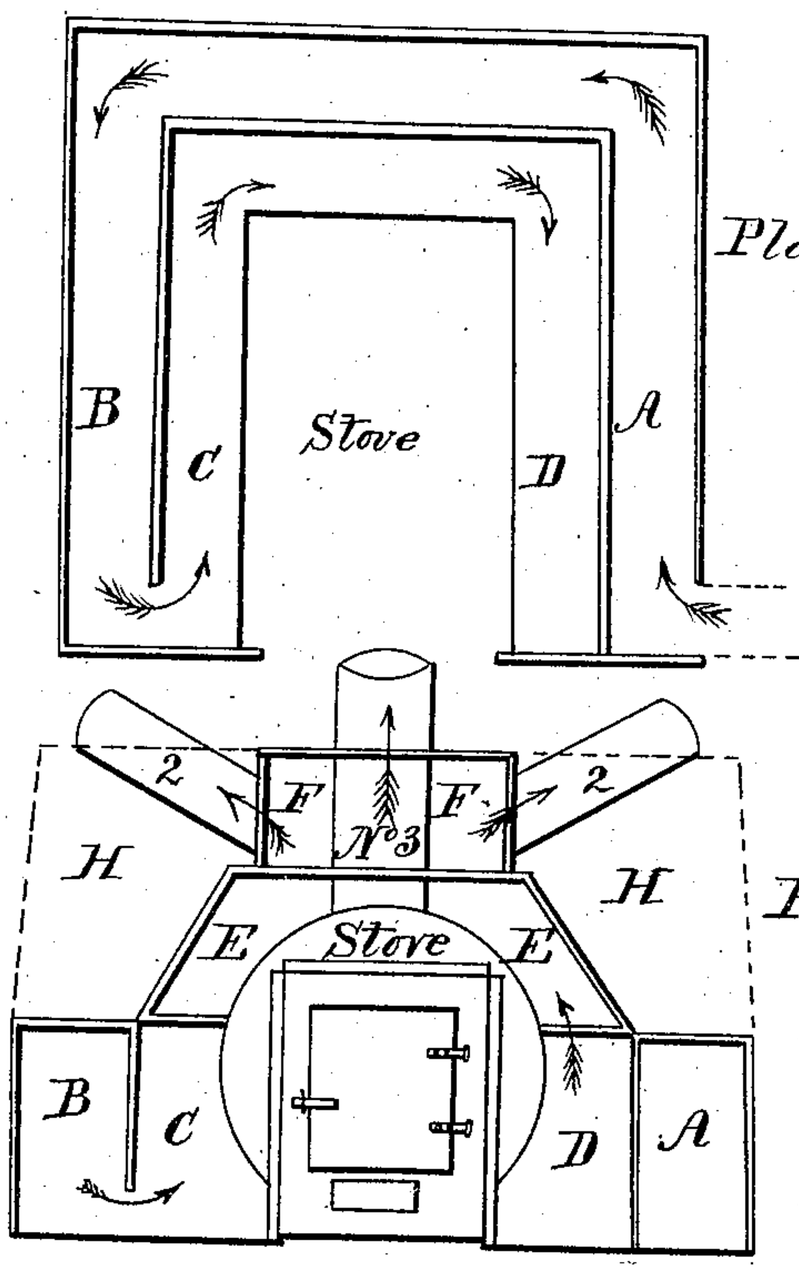
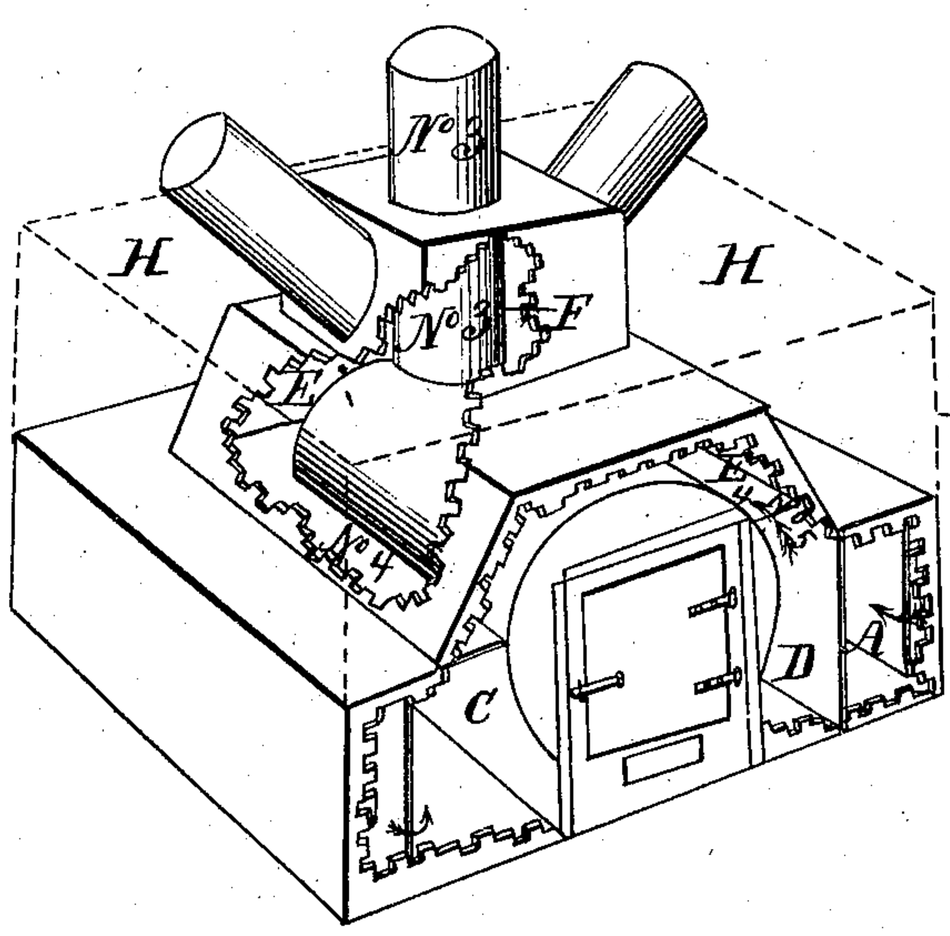
J. Child.

Hot Air Furnace.

No. 19,683. Patented Mar. 23, 1858.





UNITED STATES PATENT OFFICE.

JOHN CHILD, OF ELYRIA, OHIO.

HOT-AIR FURNACE.

Specification of Letters Patent No. 19,683, dated March 23, 1858.

To all whom it may concern:

Be it known that I, JOHN CHILD, of Elyria, in the county of Lorain and State of Ohio, have invented a new and Improved Mode of Constructing Hot-Air Furnaces; and I hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters and figures of reference marked thereon, the same parts being indicated by the same letters and figures in the three plates of the drawings.

The nature of my invention consists in so constructing the stove for a furnace heated by wood that boiler iron, which for such a purpose has many advantages over cast iron, shall be sufficiently stiff for the purpose, and in so dividing the large chamber around the stove into air passages and chambers as to more thoroughly heat the air and increase the current and quantity passing through the furnace. To effect the first object, I construct the boiler iron stove with the sides and top nearly cylindrical as seen in Plates 1 and 3. The bottom of the sides and ends is let into the brick which constitutes the bottom of the chamber and upon which the fire is made. To aid in the second object, I also attach to the stove (No. 4, 4, Plates 1 and 3) horizontal wings passing all around the sides and back of the stove, made of the same material or of sheet iron, which answers for top of air passage C, D, as hereinafter described. After so bedding the bottom of the stove, I construct a large chamber around and even with the front of the stove with divisions as seen by the drawings so that the cold air entering from the feeder (No. 1, Pl. 1, 2, 3) near the front of the chamber into air passage A, B, (Pl. 1, 2, 3) which is not in direct contact with the stove, passes around the chamber to near the front on the opposite side, when it enters through an aperture in partition wall between passages A, B, and C, D, into air passages C, D (same plates) next the stove and under its wings, and formed by them and said partition wall. The air then passes back around the stove in contact with it to near the front on the same side where it entered and up at No. 5, (Pl. 1 and 3) through an aperture in, or a shortening of said wing, into hot air chamber E, E, above the stove (Pl. 1 and 3) which chamber extends across the whole area of the large chamber. The air then passes over the stove and back to back part of said chamber E E and up through an extended opening into hot air chamber F, (Pl. 1 and 3) whence it is taken by air pipes 2—2 to where it is wanted. When I desire to further increase the heat in the chamber I carry the smoke pipe No. 3, around the chamber E, E. This is especially advisable when it enters the chimney near the furnace.

The stove and furnace may be made of any size, according to the amount of hot air required. Chambers E, E, and F, should be as small as possible in order more rapidly to rarefy the air and hence increase its motion, and I usually begin to build the outer walls of E, E, on the partition wall between A, B, and C, D, and I draw it in as seen in Plates 2 and 3. I also build chamber F, about half the length of E, E, or no larger than sufficient to give room for the smoke pipe to go through it and to receive the different hot air pipes that may be needed.

For the purpose of protecting the furnace and preventing the escape of heat, I usually inclose the whole by a wall either resting upon the external walls of the lower outer air chamber or passage as indicated by the dotted lines in Plates 2 and 3 or in close external contact with them. This wall forms dead air chamber H, H.

All references herein and in the original specifications are to the amended drawings.

The chief advantage of this mode of constructing furnaces consists, first, in the form of the stove, as with this form. Boiler iron can be used which is much better for the purpose than cast iron, but which in the usual form will soon burn out or cave in, and second, in the application of the air to the stove, whereby the cold air becomes gradually heated and acquires rapid motion, so that an abundant supply of fresh air thoroughly warmed in its passage is continually entering chamber F.

When coal is used for fuel the form of the stove is varied, being tall and circular like the common pot or stove in coal hot air furnaces, but the air is applied in the same manner, *i. e.* it passes around the outside as before described, then in upon the stove in the same manner and back under its wings, attached to the stove as before, thence up through an opening in the wings as at No. 5 into chamber E, E. From the fact that the coal stove is much taller than the one in

the plate, chamber E, E, will not extend over it, but only around it, the top of the stove being in chamber F, hence the air will again pass around the stove, and should enter chamber F, in front instead of back of the chamber. The general form of the furnace for the coal stove may be square or circular; for the wood stove it is usually square.

The whole furnace except stoves, wings and pipes, may be built of brick or stone—the horizontal walls being supported by cross iron bars—or partly of brick and partly of stone, or the partitions may be made of iron or other incombustible material.

I do not claim the gradual heating of air in its approach to the fire chamber of a furnace; but

I do claim—

The arrangement whereby I effect the gradual heating and an active circulation of air by the arrangement of the horizontal prolonged passages A, B, and C, D, surrounding the fire chamber and the rarefying chambers E, E, and F above the fire chamber constructed and operating as set forth.

JOHN CHILD.

Witnesses:
P. BLISS,
M. E. THORP.