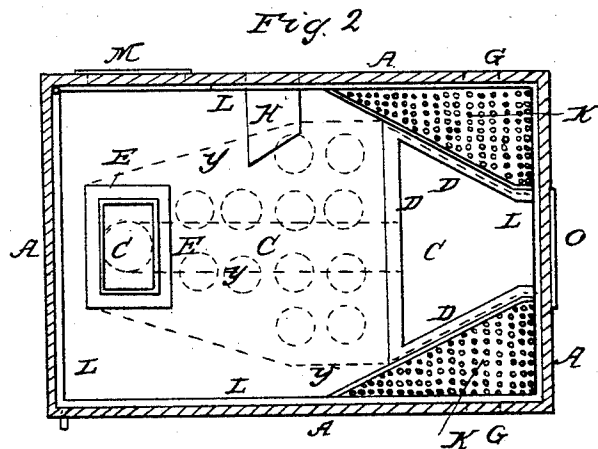
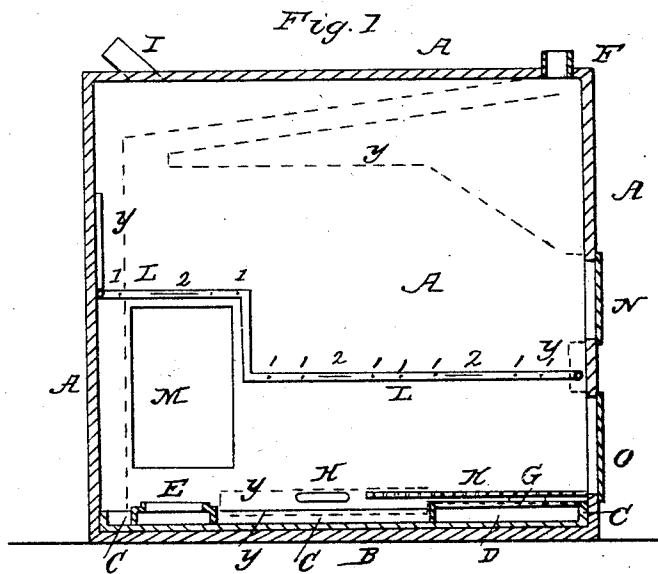


J. LEEDS.
Hot-Air Furnace.

No. 30,738.

Patented Nov. 27, 1860.



witnesses
Wm. Morrison
B. Ridgway Evans.

Inventor
Joseph Leeds

UNITED STATES PATENT OFFICE.

JOSEPH LEEDS, OF PHILADELPHIA, PENNSYLVANIA.

HOT-AIR FURNACE.

Specification of Letters Patent No. 30,738, dated November 27, 1860.

To all whom it may concern:

Be it known that I, JOSEPH LEEDS, of the city of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in the Mode of Moistening the Air on its passage through the air-warming chamber of furnaces for heating buildings; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a vertical longitudinal section of an air-warming chamber having the improvement applied thereto; and Fig. 2, a plan view of the same, like letters, when on the different figures, indicating the same objects.

Observing the provisions of the Great Producer and Ruler of the Universe, for moistening the atmosphere—in the evaporation of water, gently, from the surface of the earth, and its periodical returns through the air, in the form of rain—it is the object of my invention, to imitate these beautiful and efficient operations, as nearly as may be, on comparatively so minute a scale, simply for the purpose of further moistening or keeping up the healthful hygrometric condition of the air warmed in the warm-air chamber of air heating furnaces in buildings.

It consists in covering the lowest part, or floor, of the warm-air chamber of a furnace, with a surface of water, and supporting the heater directly over the same, both being arranged in such relation to the fresh-air inlets, as to cause the entering air to carry up and absorb the moisture gently evaporated from the water below by the said heater; and in combination therewith providing for a periodical discharge of spray, or minute jets of water, through the said rising, warm air, as occasion may require, substantially in the manner hereinafter described, whereby I am enabled to keep the so warmed air of dwellings, &c., in a more healthful hygrometric condition than heretofore, and also to increase the degree of moisture more quickly in the same, as occasion may require.

In the drawings, A, A, are the walls of the warm-air chamber; B is the floor, or bottom, of the same; C, a shallow, open vessel for holding water, occupying the whole area of the bottom (B); D, the ash-box walls

and support for the front end of the heater—the general relative position of the latter being indicated by the dotted outlines $y-y$; E, the walls of the dust-chamber, (usually arranged beneath the main back-flue of the heater), and also serving as a support for the rear end of the said heater; F, the escape-flue; G, G, the fresh-air entrances to the exterior of the heater; H, the fresh-air entrance to the interior radiating flues—when such flues are found in the heater, as indicated in the drawings; I, one of the usual escapes, or leaders, for the warmed and moistened air; K, K, are perforated distributing and deflecting plates above the air entrances (G, G.); L, the jet or spray pipe; M, the man-hole door of the warm-air chamber; N, the fire chamber door; and O, the door of the ash-box.

The general form, or construction and combined arrangement, of the warm-air chamber and its contained heater, is substantially the same as those in common use; and therefore a detailed description of these is not necessary, except in so far as the adaptation of my invention, to them, is concerned.

The water vessel (C) may be made of cast-iron, terra-cotta, or any other material that may be adapted to the purposes of holding water and bearing the weight of the heater, etc. It is made with a flat bottom and raised sides and ends, so as to be capable of resting firmly on the bottom of the warm-air chamber, and of holding water of a uniform depth of, say 2 or 3 inches, more or less, and of sufficient length and breadth to cover the whole area of the bottom, or floor, of the said warm-air chamber. It should also be provided with any sufficient outlet to prevent overflowing, and a clearing pipe, fitted with a stop cock, in any suitable manner, to drain off the whole of the water when required.

The walls (D) which form the ash-box, and those (E) which form the dust chamber, constitute, also, two piers for supporting the heater above the water, and are made of bricks which will allow sufficient water or moisture to soak through, from their outer sides, to dampen the ashes and prevent dust from rising therefrom, and should also be built of sufficient height to support the heater at a few inches above the surface of the water in the vessel (C).

The fresh-air which is introduced at

G, G, or opposite the hot sides of the fire chamber, is prevented from rising upward too directly, by being partially deflected so as to be more generally diffused around the heater, by means of the plates K, K; and, in order to insure the passage of fresh-air through any interior, radiating flues which may be in the heater, the fresh-air pipe (H) should be made to reach beneath the mouths of the same, in any suitable manner.

The jet or spray pipe (L) is fixed around to the inside of the walls (A—A), of the warm-air chamber, in as nearly a horizontal position as may be consistent with draining it, and at about one third, more or less, the height of the heater. It is perforated with very minute holes 1—1, or slots 2—2, in such a manner as will allow numerous jets or sprays of water to issue therefrom—the said pipe (L) being connected with a head-pressure of water, sufficient for the purpose, in any suitable manner; and also fitted with stop, and discharge cocks, arranged in any suitable manner, to enable any one, conveniently to discharge spray or jets of water therefrom into the rising warm air of the chamber, or to stop them and drain the pipe (L), as occasion may require.

In the operation of these devices, the heater necessarily produces a moderate or gentle evaporation from the surface of the water in the vessel (C), and the fresh air, coming through the inlets (G, G, and H,), becoming warmed, takes up the vapor and passes to the conducting or leading pipes (I), and thence to the different apartments of the building, in the usual manner; and should the hygrometric condition of the air in the rooms, at any subsequent time, require a larger proportion of moisture, it can be furnished in a few minutes by turning on the head-pressure of water connected with the pipe (L), and so producing a continuous discharge of water, in the form of jets or spray, through the rising air of the warming chamber; thus, together, enabling any one to preserve a regular, healthful, and natural

hygrometric state of the air in the rooms of the building, or, at pleasure, to quickly increase the degree of moisture therein in a more perfect or natural manner than heretofore; besides, the low position, and extensive surface of water, described, insure the arrest of all particles of dust which may be in the entering air—a result, it is believed, which has never before been effected in air-warming furnaces.

I am aware that evaporating boilers or pans, have been used upon different parts of the heater for the purpose of moistening air; and that jets of steam from pipes, leading from steam-boilers outside of the warm-air chamber, have been used for the same purpose; but neither of these modes of moistening the air has been found sufficient in practice to produce that agreeable and healthful hygrometric condition of the air, warmed by a furnace, which is natural to our atmosphere, aside from the difficulty of keeping the said pans, or boilers, at all times supplied with water.

I do not claim, broadly, the moistening the air in the warm-air chamber of a heater for buildings; nor do I confine my invention, in its application, to any particular form of heater, or warm-air chamber; but,

Having fully described my improvement, and pointed out its superior utility, what I claim as new and desire to secure by Letters Patent is—

Providing a surface of water over the lowest part, or floor, of the warm-air chamber, and below the heater thereof, substantially in the manner described, and for the purpose specified, and in combination therewith discharging spray, or minute jets of water, through the rising air in the warm-air chamber, substantially as described and for the purpose specified.

JOSEPH LEEDS.

Witnesses:

BENJ. MORISON,

B. RIDGWAY EVANS.