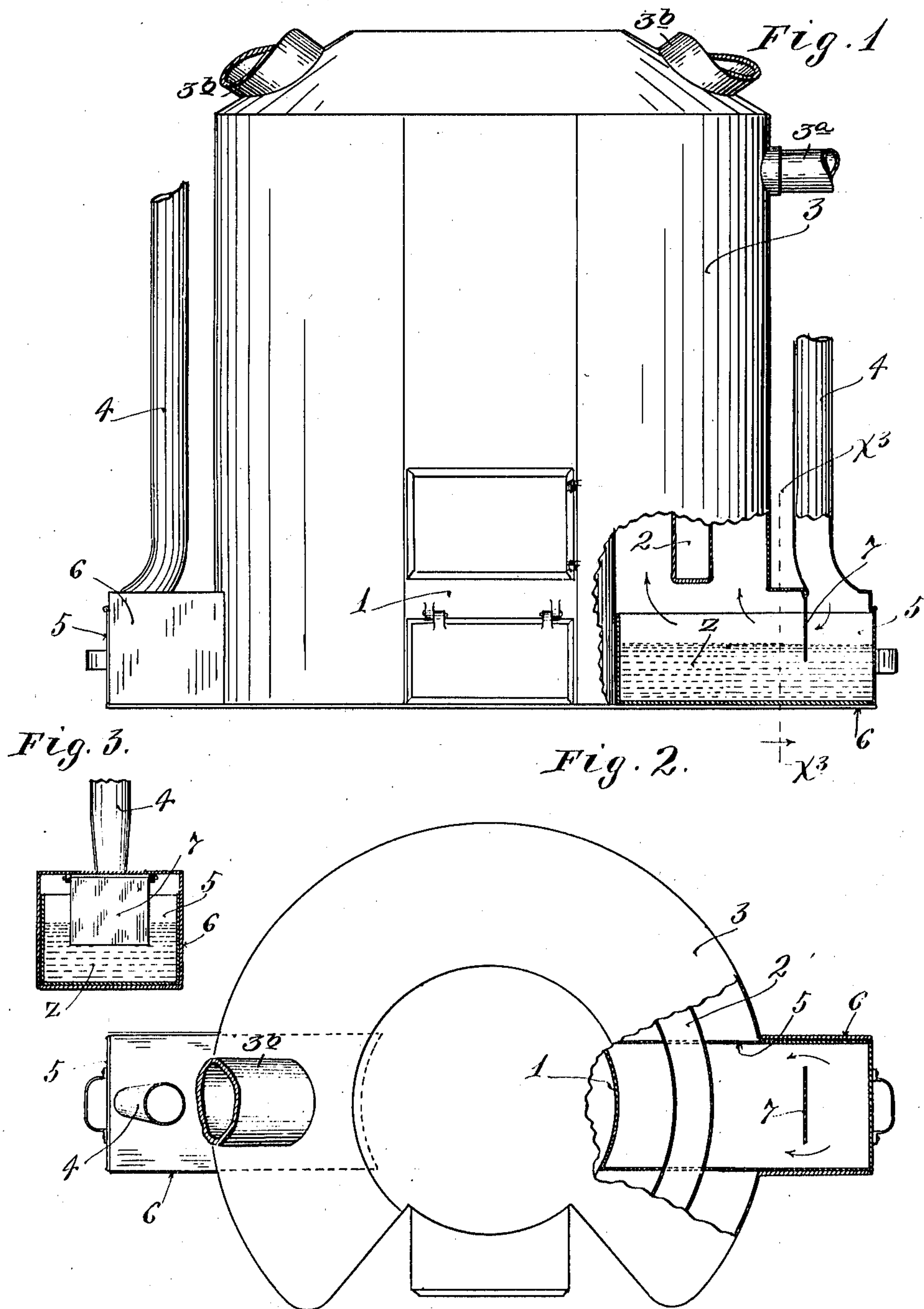


W. R. KNIGHTS.
HOT AIR FURNACE.
APPLICATION FILED JAN. 15, 1906.

988,356.

Patented Apr. 4, 1911.



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UNITED STATES PATENT OFFICE.

WILLIAM R. KNIGHTS, OF MINNEAPOLIS, MINNESOTA.

HOT-AIR FURNACE.

988,356.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM R. KNIGHTS, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, 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 hot air furnaces, and has for its object to improve the same in the several particulars hereinafter noted.

The invention consists of the novel devices and combinations of devices hereinafter described and defined in the claim.

In the accompanying drawings, which illustrate my invention, like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view principally in front elevation, but with some parts sectioned and some broken away, illustrating my invention applied to a hot air furnace of standard construction, such as that known to the trade as the "Knights" heater; Fig. 2 is a plan view of the improved heater, some parts being shown in diagram only, some being sectioned, and others being broken away; and Fig. 3 is a detail taken in section on the line $x^3 x^3$ of Fig. 1.

Of the parts of the furnace, it is only desirable for the purposes of this case to note the fire pot 1, the secondary combustion chamber or heat cylinders 2, and the exterior casing 3. The heat cylinders 2, it will be understood, are in communication with the main fire chamber and fire-pot, and with a draft flue or pipe (not shown), such being the standard construction. The hot air pipes 3^b lead upward from the top of the casing 3 in the usual way. The numeral 4 indicates cold air return pipes which open into the lower portion of the casing 3.

My invention has for its particular object, first, the precipitation and collection of all dust and dirt carried from the room, or several rooms, back into the hot air chamber of the furnace by the cold air return pipe or pipes, and second, to evaporate into the air circulated through the air chamber of the furnace sufficient water to prevent dryness of the air, or in other words, to keep the air moist and in proper condition from a hygienic point of view.

To the above ends, I provide in connection with the cold air return pipe, a water containing pan or vessel in the form of a drawer, some portion of which is located directly under the lowermost or delivery end of such cold air return pipe, or is so related thereto that the air, is passing from the cold air return pipe to the hot air chamber of the furnace, will move in a downward direction toward the water in said pan, and hence will precipitate dirt and dust carried by the air directly into the water. In this way, the dust or dirt is removed from the air and held by the water, and furthermore, rapid evaporation of water into the air is insured.

The device is preferably arranged as shown in the drawings, wherein the numeral 5 indicates elongated water pans that are adapted to be slid to and from working position through neck-like extensions 6 of the shell or casing 3. The cold air return pipes 4, of which, in the drawings, only two are shown, open directly into the upper portion of the case extension 6 and, it will be noted, the said cold air pipes, just above their junction with the extension 6, are curved outward, so that the air is caused to make a more abrupt turn in passing from the cold air pipes into the air heating chambers of the furnace. It will also be noted that when the pans 6 are in working position, their outer end plates close the openings in the outer ends of the case extension 6. The case extension 6 and the pans 5 are made much wider than the cold air return pipes, and baffle plates 7 are preferably hung from the upper plates of the case extension 6, just inward of the cold air return pipes 4. These baffle plates 7 preferably depend into the water z contained in the pans 5, and they are hinged at their upper edges so that the said pans may be readily removed from the furnace. Furthermore, by reference to Figs. 2 and 3, it will be noted that the baffle plates 7 extend very much less than completely across the pans 5, so that free passages are left for the air on the opposite sides thereof. The said baffle plates, however, cause the returning cold air to move in a horizontal direction, as well as in a vertical direction, in passing from the cold air return pipes into the hot air chambers of the furnace, thereby increasing the tendency to precipitate the dust into the water contained in the pans 5. It is also important to

note that the inner ends of the pans 5 are adapted for direct engagement with the lower portion of the fire box 1, so that the water contained therein will be heated, and
5 thereby greatly increase the rate of evaporation. By moving the inner extremities of the pans directly into contact with, or slightly out of contact with, the fire box 1, the water may be evaporated more rapidly,
10 as may be required.

It will be observed that the casing extensions 6 have a cross section very greatly in excess of that of the corresponding cold air return pipes. This is important because the
15 velocity of the returning dust laden air is reduced in passing from the cold air return pipe through the said extension; and this, as is evident, gives very much better chance for the dust to settle into the water.

20 The improved dust collecting and evaporating device above described is also adapted for use in connection with cold air inlet pipes that lead directly from the outdoor atmosphere into the air heating chamber of
25 the furnace.

The device above described adds very little, if anything, to the cost of the furnace, and greatly improves the action thereof both by rendering hot air heating systems cleaner and the air moist and in proper condition 30 to be taken into the lungs.

What I claim and desire to secure by Letters Patent of the United States, is as follows:

In a hot air furnace having an extension 35 6 and a cold air pipe 4 opening into the top of said extension, of a water pan 5 seated within the air chamber of said furnace and in the said extension 6, a portion thereof being below the delivery end of said cold air 40 pipe, and a deflecting plate 7 located within said extension 6 and extending less than completely across said pan 5, substantially as described.

In testimony whereof I affix my signature 45 in presence of two witnesses.

WILLIAM R. KNIGHTS.

Witnesses:

MALIE HOEL,

F. D. MERCHANT.