No. 856,341. PATENTED JUNE 11, 1907.

F. FISHER.

SMOKE CONSUMING FURNACE.

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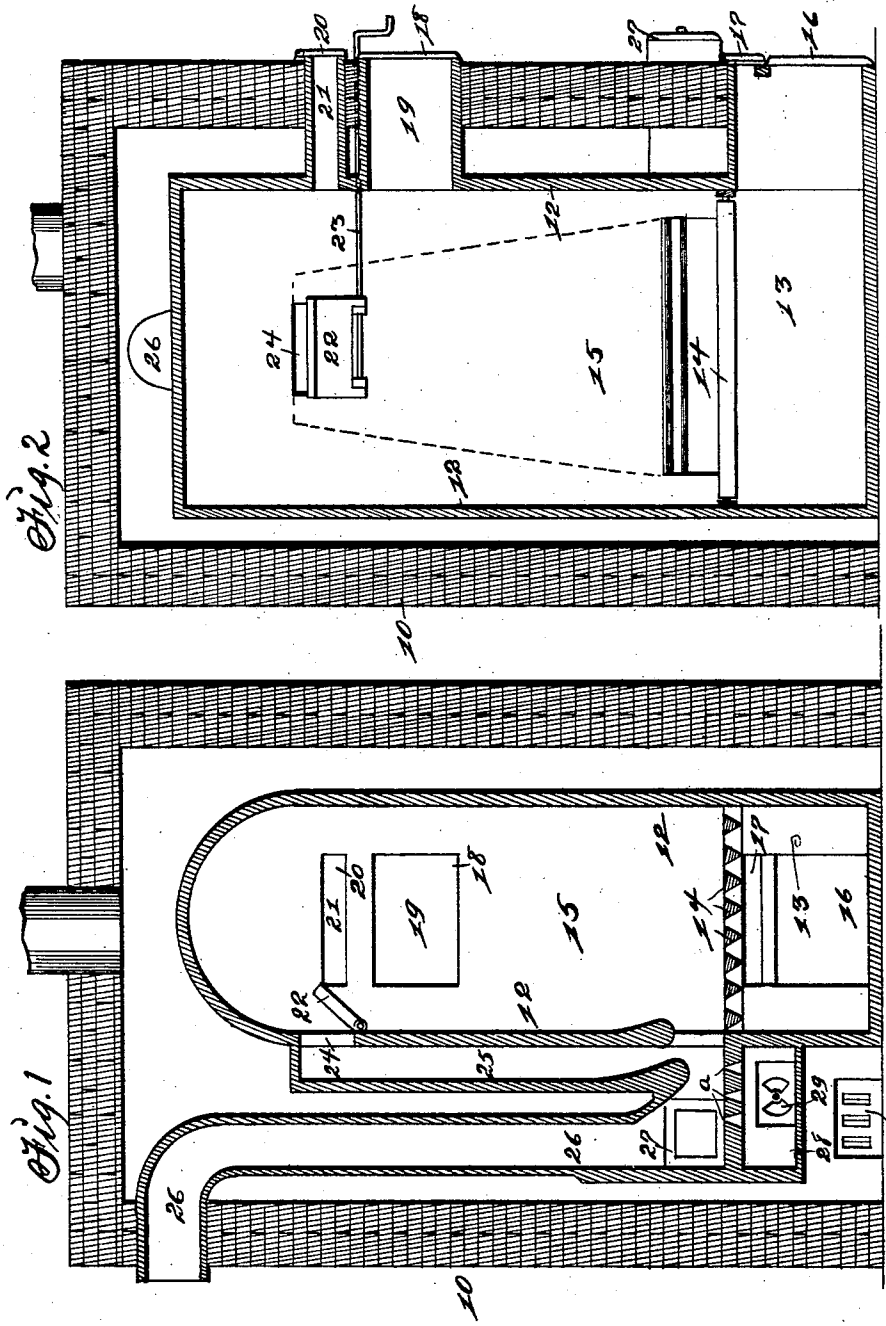


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# UNITED STATES PATENT OFFICE.

FRANK FISHER, OF DES MOINES, IOWA.

## SMOKE-CONSUMING FURNACE.

No. 856,341. Specification of Letters Patent. Patented June 11, 1907.

Application filed April 11, 1906. Serial No. 311,200.

*To all whom it may concern:*

Be it known that I, FRANK FISHER, a citizen of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented a new and useful Smoke-Consuming Furnace, of which the following is a specification.

My object is, first, to save fuel in producing heat; second, to prevent the annoyances incident to the production of black smoke and soot; third, to provide convenient means for regulating the condition of the fire as required to produce different degrees of heat at different times.

My invention consists in the construction, arrangement and combination of parts as hereinafter set forth, pointed out in my claims and illustrated in the accompanying drawings, in which.—

Figure 1 is a vertical central transverse sectional view of the furnace and shows the positions of the different parts relative to each other and the outer furnace wall. Fig. 2 is a corresponding view taken at right angles relative to Fig. 1.

The numeral 10 designates the outer wall and 12 the inner wall of the furnace that forms the ash chamber 13 under the grate 14 and the combustion chamber 15 above the grate and the hot air chamber surrounding the combustion chamber.

A door 16 is provided at the front of the ash chamber 13 to swing horizontally as required for removing ashes from the ash chamber and a door 17 is hinged above the door 16 to swing vertically to admit air into the ash chamber under the grate 14.

A door 18 is provided in the outer wall 10 to a passageway 19 that communicates with the combustion chamber 15, as shown in Fig. 2, as required for filling in fuel.

A passageway 21 for air is provided above the fuel passageway 19 and a door 20 hinged to the wall 10 for opening and closing the passage as required for regulating the burning of fuel on the grate 14.

A damper 22 is hinged to the inner wall 12 and provided with a handle 23 for opening and closing an opening 24 at the top portion of the combustion chamber 15 as required to allow products of combustion to pass from the chamber 15 into an auxiliary combustion chamber 25 connected with the wall 12 and open at its lower end, as shown in Fig. 1, to communicate with an escape flue 26 that communicates with the lower ends of the combustion chambers 25 and 15 immediately above the grate 14 and within the hot air chamber as shown in Fig. 1. A door 27 is provided at the bottom of the escape flue as required to get access for cleaning ashes and clinkers therefrom. An air chamber 28 under the bottom of the flue 26 is provided with a register 29 to admit air from the outside of the furnace and vents *a* allow the air to pass up to mingle with the products of combustion that pass upward from the two combustion chambers 15 and 25. Pipes for conducting heat from the hot air chamber between the two walls are fixed in the top of the outer wall 10 in any suitable way.

When the damper 22 is closed there will be a direct draft from the lower end of the combustion chamber 15 and the fuel on the grate 14 into the escape flue 26 and when the damper is open products of combustion will rise in the chamber 15 and descend in the auxiliary chamber 25 and all the radiating surface of the two chambers will be utilized to heat the air in the hot air chamber surrounding them. By this means the heat may be readily regulated as required for use at different times.

Having thus set forth the purposes of my invention and its construction and use, the practical operation and utility thereof will be obvious.

What I claim as new and desire to secure by Letters-Patent, is.—

1. The combination of a main combustion chamber, an escape flue communicating therewith at the lower end thereof, an auxiliary combustion chamber communicating with the main combustion chamber at the upper portion thereof and with said escape flue, means for supplying air to said escape flue where said flue communicates with said combustion chambers and a damper for controlling the communication between said combustion chambers whereby the products of combustion may be caused to pass directly to the escape flue or indirectly thereto through said auxiliary combustion chamber.

2. A furnace comprising an outer wall, a hot air chamber, an ash chamber, a grate over the ash chamber, a combustion chamber above the grate open at its rear lower end, an auxiliary combustion chamber in rear of the main combustion chamber and provided with an opening communicating with the main combustion chamber and a damper in the opening, an escape flue within the hot air

chamber communicating at its lower end with the lower ends of the two combustion chambers, an air chamber under the auxiliary combustion chamber provided with a register to admit air from without the furnace and vents in its top to admit air to mingle with the products of combustion at the lower open ends of the auxiliary combustion chamber and the escape flue within the hot air chamber and a doorway and door at the lower end of the escape flue in a plane above the grate, as set forth.

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