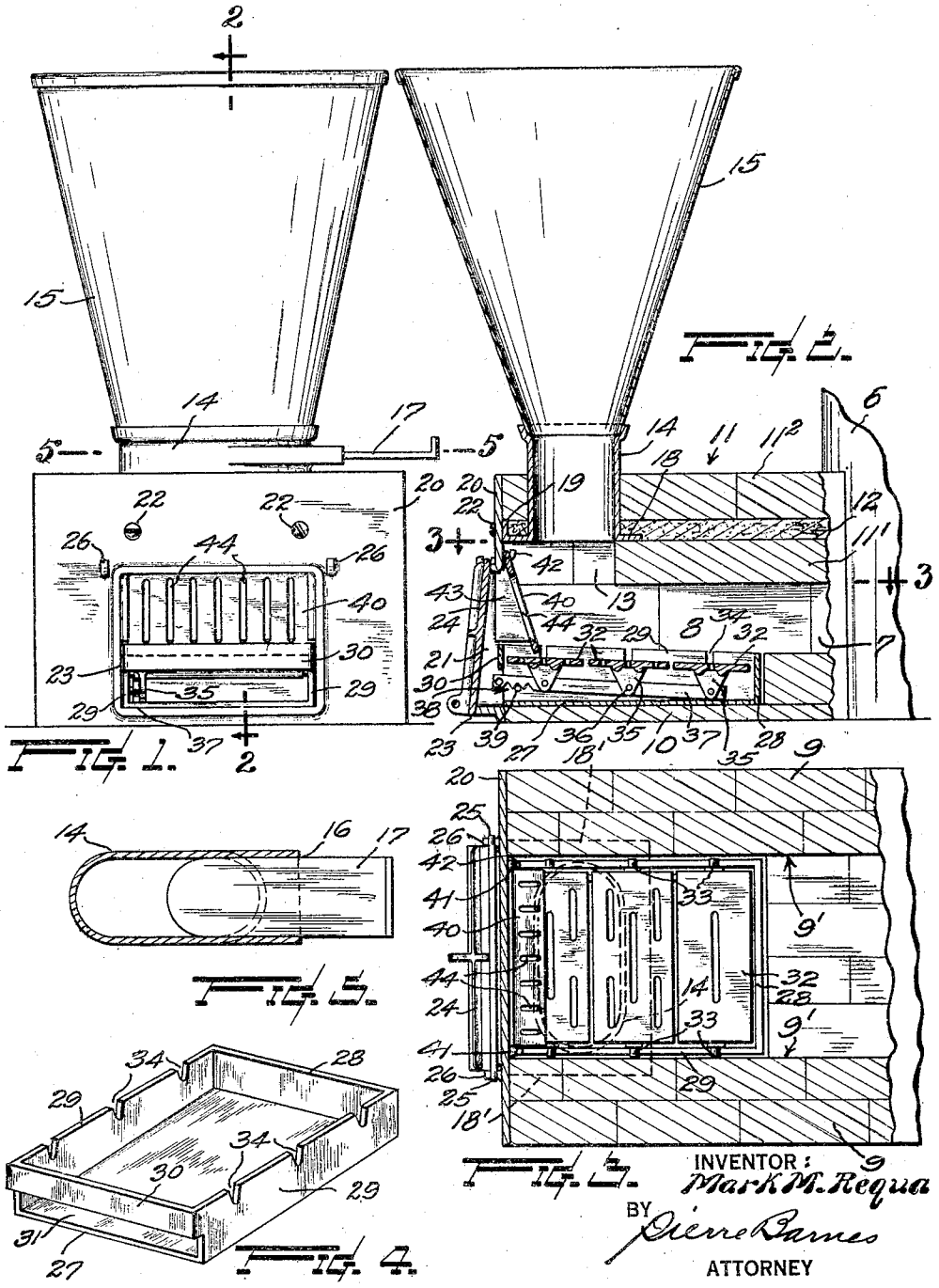
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FURNACE

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FURNACE

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This invention relates to a furnace of that class known as "Dutch ovens".

An object of my invention is to produce an efficient furnace of this character which is adapted for use with household heaters for burning sawdust and other comminuted fuels.

Another object of the invention is to provide a wood-refuse furnace requiring but little attention and supervision.

Another object is to provide a furnace all parts of which are readily accessible and arranged to facilitate their adjustments and removal for cleaning purposes.

Another object is to provide a furnace having a fuel hopper adapted to provide an automatic feed subject to the control of a damper device whereby the supply of fuel may be regulated as to quantity or stopped at will.

More specific objects and advantages of the invention will appear in the following description.

The invention consists in the novel construction, adaption, and combination of parts hereinafter described and claimed.

In the accompanying drawings,—

Figure 1 is a front elevation of a furnace embodying my invention, the door being omitted to permit seeing into the interior of the furnace. Fig. 2 is a vertical sectional view on line 2—2 of Fig. 1; Fig. 3 is a sectional view taken substantially on broken line 3—3 of Fig. 2; Fig. 4 is a perspective view of the grate frame; and Fig. 5 is a detail section substantially on line 5—5 of Fig. 1.

In said drawings, the reference numeral 6 represents a portion of a household heater of known or suitable type having an inlet opening, as at 7 Fig. 2, which communicates with the rear end of the combustion chamber 8 of the furnace embodying the present invention.

Said furnace is constructed of a general tubular form, through the entire length of which extends a tunnel-like cavity of which said chamber 8 constitutes its rear portion.

Side walls 9, and roof 11 of the furnace structure are preferably constructed of brick or of an equivalent material and, as shown, is composed of two thicknesses or courses, the inner course being preferably of fire brick. Between the courses 11^1 and 11^2 of the brick work of the roof is advantageously provided a layer of asbestos, or other heat insulating material, indicated by 12. Heat insulating material may also be employed in the side walls 9 if desired.

In the front portion of the roof course 11^1, between the planes of the inner surfaces 9^1 of the side walls, is an opening 13 which communicates with a transversely elongated spout 14 of a fuel feed hopper 15, herein shown as of a funnel shape. The major diameter of the opening of the hopper spout 14 is equal to the distance between the side surfaces 9^1 of the combustion chamber, or nearly so, as indicated by dotted lines in Fig. 3; the minor diameter of the spout opening being relatively short, whereby the fuel from the hopper is caused to be delivered into the combustion chamber in a thin columnar formation extending substantially the entire width of said chamber. As shown, the spout 14 is provided in one of its sides (Fig. 5) with an opening 16 to accommodate an imperforate plate 17 to serve as a gate valve which is adapted to perform two functions; one of which is to vary the effective opening of the spout for regulating the volume of fuel fed into the combustion chamber, and the other is to close the opening to prevent the delivery of fuel from the hopper as when cleaning the furnace, when kindling a fire, or for stopping the same.

As shown, the spout 14 is provided at or near its lower end with a horizontal flange in the nature of a plate 18 which is set upon the roof course 11^1 to extend, as indicated by dotted lines 18^1 in Fig. 3, into the side walls 9 of the furnace structure to be firmly supported thereby.

The plate element 18 of the nozzle member is provided at its front end with an upturned rib portion 19 (Fig. 2) which fits against a plate 20 which constitutes the front wall of the tunnel 21, the rear portion thereof affording the combustion chamber 8.

Said front wall 20 is rigidly secured to the spout member as by means of bolts 22 engaging the rib 19 of the plate element 18.

Said front wall is provided with an opening 23, in elevation extending from about the plane of the under surface of the roof 11 of the combustion chamber down to about the level of the upper surface of the floor 10; and, in width, extending to or outside of the respective planes 9^1 of the furnace walls 9.

For this wall opening 23 is provided a swingable door 24 (omitted from Fig. 1) provided near its top with laterally protruding gudgeons 25 engaging in notched lug elements 26 of the front wall 20. Provided in the combustion chamber 8 and extending into the tunnel part 21 is a rectangular frame, or drawer as hereinafter termed, comprising a bottom 27, from the back and side edges of which are upwardly extending walls 28, and 29, respectively.

The side walls 29 of the drawer, preferably, are highest at the front whereat they are connected by a transverse bar 30 in spaced relation above the plane of the bottom 27 to afford below the bar an opening 31 through which ashes may be dumped after the drawer is removed from the furnace.

Said drawer, moreover, serves as the frame member of the furnace grate, said grate having bars 32 of the rocker or shaking type, having at opposite ends trunnions 33 to engage in notches 34 provided therefor in the sides 29 of the drawer.

For rocking the grate bars 32, the same are provided with depending arms 35, one for each bar, connected (Fig. 2) by pivot pins 36 with an operating and regulating bar 37 having rack teeth 38 which are engageable with a stop pin 39 protruding from said drawer, or grate frame.

40 represents a partition disposed within the tunnel of the furnace and sets off the combustion chamber 8 from the air cavity adjacent to the door 24. As shown, said partition is hingedly connected at its top by means of studs 41 engaging in notched lug elements 42 of the front wall 20 and is normally held in the inclined position in which it is illustrated in Figs. 2 and 3 by a bolster element 43 of the wall 20, which permits the partition being swung rearwardly and upwardly to give access into the combustion chamber to enable a fire to be kindled therein, and also to be swung clear of the drawer permitting the removal of the latter. The partition, furthermore is provided with draft openings 44 for the admission of air for combustion purposes, the air passing through the space between the partition and the door prevents the latter becoming unduly hot.

Air is admitted into the tunnel only when the door 24 is opened to a desired extent. A portion of the air thus admitted enters the chamber 8 from in front through the draft openings 44 in the partition 40, and other portions enter the chamber from below through openings such as slots provided in the respective grate bars and also through openings between the successive bars.

From the foregoing, it is apparent that the draft may be admitted and controlled by opening the door 24, more or less; and regulating the quantity of air admitted through the grate by adjusting the rotary positions of the several grate bars by means of the operating rod 37.

In operation, fuel is supplied from the hopper 15 by gravitation through the spout 14 into an end of the chamber 8 whereat it commences to burn, and continues as the fuel spreads upon the grate; the lighter burning particles being drawn or carried by the flow of air and gaseous products of combustion toward the flue, or passage 7, whereby substantially all of the combustible particles are consumed before traversing the grate bar assembly.

To clean the grate of ashes etc., the same is deposited in the drawer by rocking the grate bars; and, to remove the ashes from the drawer, the latter is withdrawn from the furnace and dumped from below the grate bars through the opening 31 by suitably tilting the drawer.

The invention and the manner of utilizing the same will, it is thought, be understood from the foregoing description of the illustrated embodiment thereof.

What I claim, is,—

1. A furnace of the character described, comprising a structure having a tunnel extending through its entire length, a door at the front end of the tunnel, a grate arranged for longitudinal movement in the tunnel, a plate pendantly hinged to the tunnel structure disposed above and at the front end of the grate, said plate being adapted to serve as a partition to divide the tunnel into an air space in front of the partition and a combustion chamber to the rear thereof, a fuel hopper provided with a spout located above the front portion of said combustion chamber, said spout having an elongated delivery aperture arranged transversely of the furnace, and a gate valve provided in said spout.

2. A furnace of the character described, comprising a structure having a tunnel extending through its entire length, a door at the front end of the tunnel, a grate arranged for longitudinal movement in the tunnel, a plate pendantly hinged to the tunnel structure disposed above and at the front end of the grate, said plate being adapted to serve as a partition to divide the tunnel into an air space in front of the partition and a combustion chamber to the rear thereof, and a fuel hopper provided with a spout located above the front portion of said combustion chamber, said spout having an elongated delivery aperture arranged transversely of the furnace.

3. A furnace of the character described,

comprising a structure having a tunnel extending through its entire length, a door at the front end of the tunnel, a grate arranged for longitudinal movement in the tunnel, a plate pendantly hinged to the tunnel structure disposed above and at the front end of the grate, said plate being adapted to serve as a partition to divide the tunnel into an air space in front of the partition and a combustion chamber to the rear thereof, and a fuel hopper provided with a delivery spout located above the front portion of said combustion chamber.

Signed at Seattle, Washington, this 23rd day of February, 1928.

MARK M. REQUA.