Aug. 7, 1951 H. W. SHARPE 2,563,137

WASTE MATERIAL CONSUMING STRUCTURE

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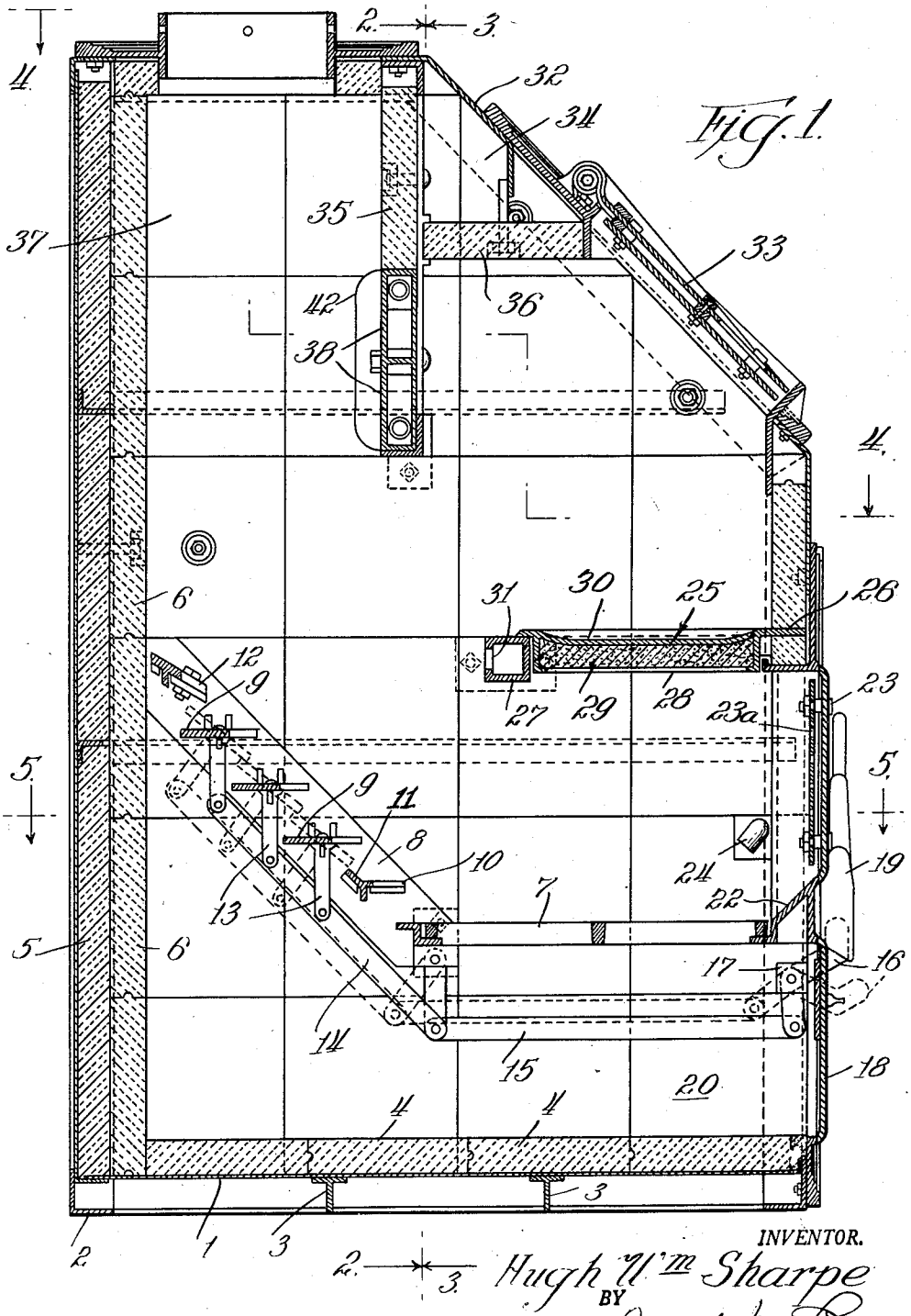

Fig. 1.

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Fig. 2.

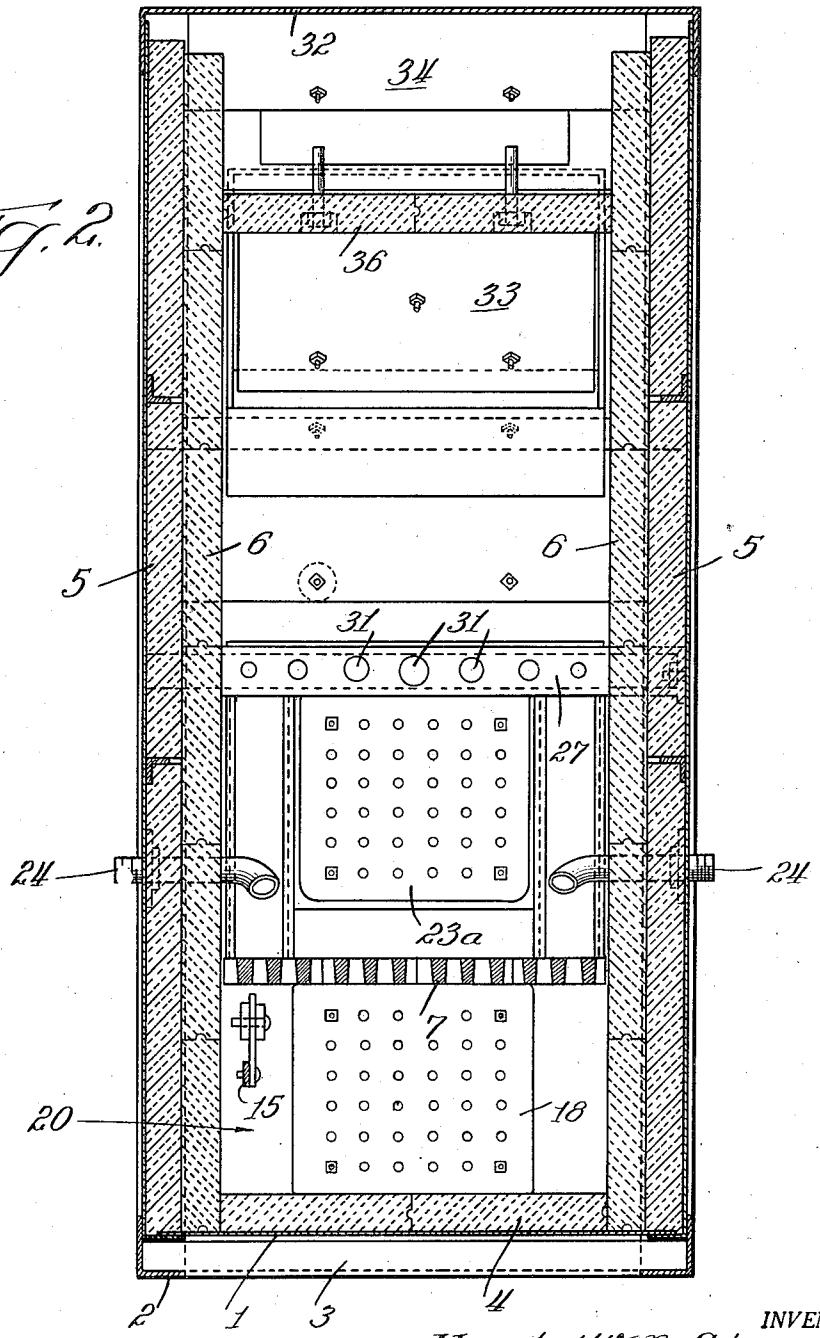

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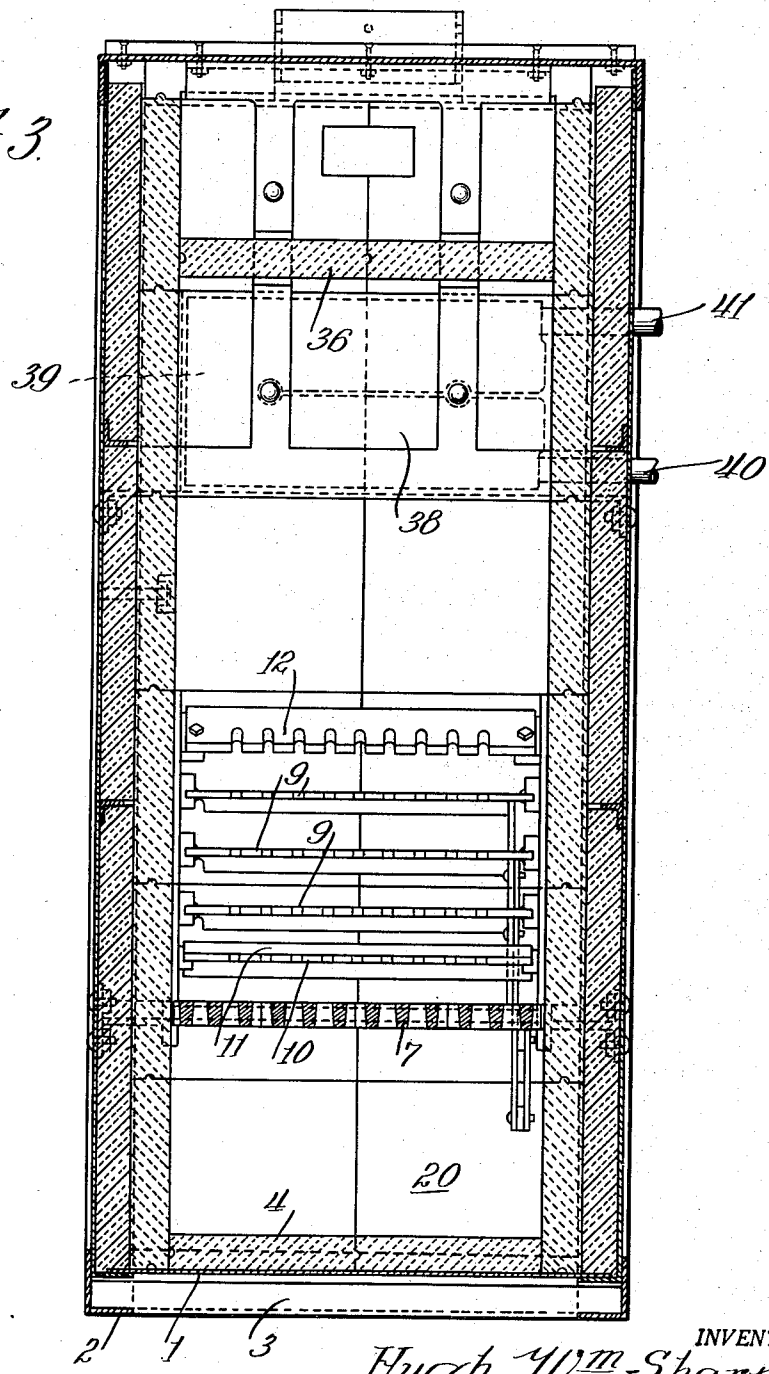
Fig. 3.



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WASTE MATERIAL CONSUMING STRUCTURE

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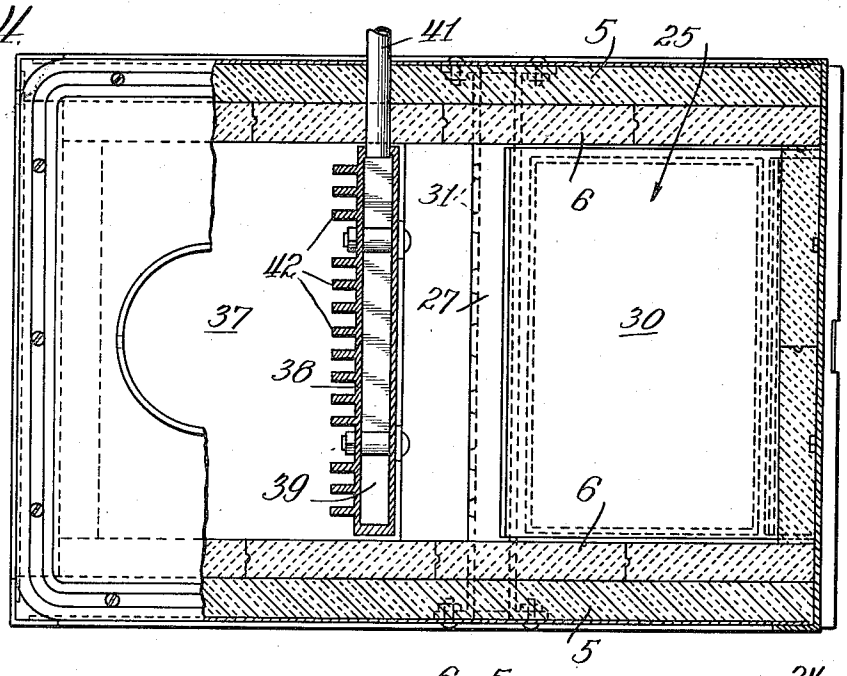
FIG. 4.



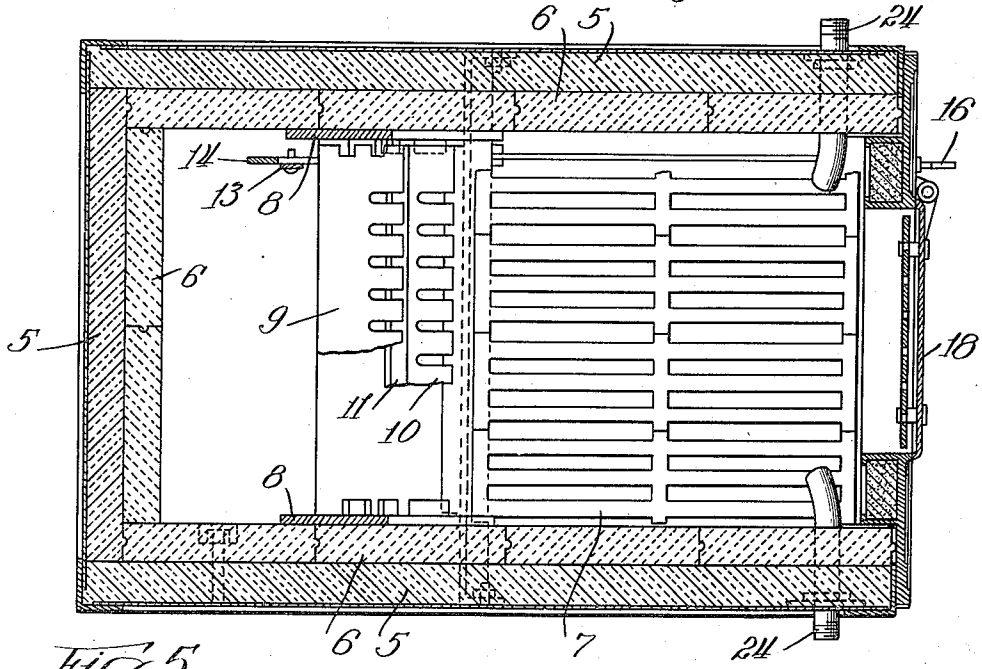


FIG. 5.

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Patented Aug. 7, 1951

2,563,137

UNITED STATES PATENT OFFICE

2,563,137

WASTE MATERIAL CONSUMING STRUCTURE

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Application November 15, 1946, Serial No. 709,971

3 Claims. (Cl. 110—18)

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This invention relates to improvements in waste material consuming structures which are also commonly referred to as garbage incinerators, and has for its general object to provide a relatively small size, cheap and efficient structure of this character which is intended, mainly, to be installed in private residences and in the smaller types of apartment buildings.

One of the main objects of the invention is to provide a structure of the type specified wherein the material to be consumed is introduced into the upper portion of the structure and becomes deposited first upon a drying shelf disposed at an appreciable elevation above the grate, and wherein there is provided also a series of spaced apart steps, simulating a stairway, so disposed that material projected from the drying shelf becomes lodged next upon the said steps before being projected upon the horizontally disposed grate of the structure.

A further object of the invention is to provide means whereby the said steps are caused to be relatively positioned, by operation of a hand lever, disposed exteriorly of the structure, to form a continuous inclined surface down which the material slides by gravity upon the grate. The means whereby the said steps are positioned to form the said slide, are manipulable also by the said hand lever, to be shaken to the degree necessary to agitate the waste material and thus promote clearance of said steps and deposit of same upon the grate.

Another object of the invention is to provide means whereby vapor arising from the usually moist or wet material deposited upon the drying shelf is caused to be admixed with products of combustion passing from the grate into the chimney flue of the structure.

Other objects of the invention are pointed out particularly in the following description or will be readily comprehended therefrom.

A suitable embodiment of the invention is illustrated in the accompanying drawings wherein:

Fig. 1 is a vertical longitudinal sectional view of a waste material burner constructed in accordance with the invention.

Figs. 2 and 3 are vertical transverse sectional views of the same taken on the single section line 2—2 and 3—3 of Fig. 1 looking in opposite directions from the vertical plane indicated thereby.

Figs. 4 and 5 are plan sectional views taken on the lines 4—4 and 5—5, respectively, of Fig. 1.

The structure comprises a rectangular housing composed, preferably, of an outer metal casing

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which includes a floor plate 1 supported in part upon a channel bar 2, along the rear edge, a series of T-bars 3 between its front and rear edges, and suitably along its front edge, there being a free space between the floor plate and the surface upon which the structure is supported by the aforesaid elements 2 and 3, which is open at its end along the side-walls of the structure.

The floor plate supports a series of refractory tiles 4, and the vertical walls are lined in part and to the greatest extent possible, with a suitable plastic lining 5 and, inwardly of the latter, with refractory tiles 6.

The grate 7 of the structure is disposed at an elevation above the tile floor 4 and is spaced from the front sheet metal wall and also to a far greater extent from the rear tile wall.

The grate is continuous between the side tile walls and is supported at its inner end upon the lower ends of side plates 8 which are secured rigidly, in any suitable manner, to the side walls of the structure and are held in contact with the tile 6 lining the latter.

Pivotally secured to the plates 8 is a series of flat plates 9. The latter are disposed at respectively different elevations to simulate a stairway leading from a point near the inner end portion of the grate 7 to a point near the rear wall of the housing, the pivotal axes of said plates 9 being disposed in a plane extending at an angle of approximately forty-five degrees to the horizontal plane of the grate 7.

A rigid plate 10, equipped with an angular flange 11, is disposed between the inner end of the grate 7 and the lowest plate 9. Another angularly disposed plate 12 is disposed above the uppermost plate 9, both plates 10 and 12 being secured at their ends to the plates 8. Plates 9, 10 and 12 constitute a support for waste material delivered from above, as will hereinafter be described.

Each plate 9 is equipped with a depending arm 13 which is secured pivotally at its lower end to a flat bar 14. The latter is secured pivotally to one end of a link 15 which, at its other end, is secured pivotally to the lower arm of a bell crank lever 16 which is suitably secured pivotally at its elbow to a bracket plate 17 of the front metal wall of the housing adjacent the hinge of the ash pit door 18 (Fig. 5).

The operating lever 19 of lever 16 is equipped with a socket in its lower end to receive the upper arm of said lever 16 telescopically (Fig. 1).

When said lever 19 is swung outwardly and downwardly from the position of Fig. 1, all plates

9 will be tipped to the dotted line position of Fig. 1, with the then lower edge portions of respective plates 9 overlapping the next lower plates and the flange 11 of the plate 9, said lower edges of the plates 9 being comb-like and thus providing air ducts to promote drying of material deposited upon the plates 9 when the latter are disposed horizontally, and for passage of some air through the uncovered portions of the recesses when said plates are disposed in their dotted line positions.

The ash pit 20, below the grate, derives air through the customary and usually damper controlled openings (not shown) in the door 18. The door 18 may be a duplicate of the door 23 which is equipped with an inner perforated plate 23a spaced from the outer and peripheral walls of said door 23, such doors being of conventional type.

The forward end of the grate 7 is secured to the inclined bracket plate 22 which is secured rigidly, in a suitable manner, to the front metal wall of the housing, as, for example, to the frame of the door 23. The latter is also hinged to said front wall and is, in all respects, a substantial duplicate of the door 18.

Material, such as waste wood, paper and the like may be introduced through the opening controlled by the door 23, usually to start a fire in the structure for pre-heating purposes, and for this same purpose and to effect ignition of fuel disposed upon the grate 7, a pair of gas burners 24 (Fig. 5) are provided, as shown, which are connectible, suitably, with the fuel gas supply pipes of the building.

At an elevation above the grate 7, a horizontally disposed shelf 25 is provided which extends over the entire width of the structure, which, for convenience, will be referred to hereinafter as a furnace.

The vertical plane of the inner edge of the said shelf is offset from the vertical plane of the inner end of the grate 7 only slightly, said shelf being supported by a pair of members 26 and 27.

A rectangular frame 28 having peripheral walls of substantially Z-shaped section supports a refractive member 29 which may consist of a suitable refractive plastic which is introduced into said frame when the latter is inverted with its cover plate 30 providing a support for the said plastic material.

Said cover plate 30 is dished slightly and presents peripheral flanges to rest upon the supports 26 and 27 and end supports secured to the side walls or otherwise provided.

It will be noted that the support 27 is provided with vent openings 31 (Fig. 2).

The top wall 32 of the furnace is disposed at an angle of forty-five degrees to the front wall and is equipped with a door controlled opening through which moist and wet waste material is dropped upon the shelf 25, the door 33 controlling said opening is, in all respects, similar to the door 19 and is hinged at top.

The portion of the top wall 32 above the door hinge covers a triangular chamber 34 bordered by the curtain wall 35 and a bottom wall 36, both walls 35 and 36 being composed of refractory tiles and suitably supported.

The wall 35 constitutes also a wall of the chimney flue 37. Below the lower end of the latter, a water heater 38 is mounted which comprises a lower water intake duct and an upper duct connected with each other by the inner end duct 39 (shown in dotted lines in Fig. 3) the pipes

40 and 41 being connectible in a customary manner with the cold water supply system and a hot water storage tank. The front and rear walls of the water heater are flush with the faces of the wall 35, the said rear wall being equipped with a series of vanes 42 projecting into the chimney flue.

The water heater 38 is suitably supported upon the side wall of the casing and constitutes a support for the curtain wall 35, and thus the latter and said heater 38, in conjunction with said side walls and rear wall of the structure, provide the chimney flue.

The said curtain wall, including the said water heater, is disposed, at its lower edge, appreciably from the shelf 25. The latter becomes very hot and thus vaporizes the water contained in the material disposed upon said shelf which would rise to fill the space between the curtain wall and the top intake door. However, air entering said space through openings in said door becomes admixed with said vapors and is caused to become humidified and admixed with products of combustion passing into and through the chimney flue and thus promotes combustion of combustible gases and soot within said chimney flue.

In the use of the structure, the dry or substantially dry material disposed upon the shelf 25 is easily projected upon the plates 9 by means of a shovel, spade or other suitable implement and may remain there for complete drying or storage and then caused to pass downwardly toward and upon the inner end portion of the grate 7 by gravity by operating the lever 16 to dispose the plates 9 in the dotted line position of Fig. 1, this descent of the material being aided by effecting a shaking or slight movement of said plates 9 from and to the said dotted line position. Spreading of said material over the grate thereafter may be effected by a hoe, rake or other implement projected through the door 23.

I claim as my invention:

1. A waste material consuming structure comprising a housing, means dividing the interior of the housing into an ash pit and an upper space, said means including a horizontal grate in the front half of the housing and a stepped waste material support extending upwardly and rearwardly, at an angle of about 45°, from the rear end of said grate to the rear wall of the housing and presenting air passages connecting the ash pit to said upper space, doors in the front wall of the housing above and below the grate, a stationary shelf extending across the front half of the interior of the housing above the upper of the aforesaid doors, a chimney flue in the upper rear portion of the housing above said waste material support, said flue including a curtain wall parallel to the front wall of the housing and having its lower edge spaced a substantial distance from said shelf, and a door in the housing directly above the shelf to admit waste to be consumed.

2. A waste material consuming structure as set forth in claim 1, wherein the curtain wall of the chimney flue is hollow and is provided with inlet and outlet openings for water to be heated.

3. The combination with the housing of a waste material consuming structure having an ash pit, of a horizontal grate in and spanning the front half of the housing above the ash pit; a support for waste material inclined upwardly and rearwardly from the rear end of the grate to the rear wall of the housing, said support including a series of plates hinged to swing about transverse

horizontal axes between horizontal, spaced positions to create a stepped formation presenting air passages connecting the ash pit to the space above said plates and positions wherein they form a downwardly sloping surface; means to rock the plates; a stationary shelf extending across the front half of the interior of the housing above and in spaced relation to the grate; doors in the front of the housing for the admission of material to the shelf and grate, respectively; and a chimney flue in the top of the housing above said inclined support.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
981,254	Fortune	Jan. 10, 1911
1,168,367	Wundrack	Jan. 18, 1916
1,270,574	Watson	June 25, 1918
1,769,880	Howle	July 1, 1930
1,787,081	McLellan	Dec. 30, 1930
2,332,591	Micol	Oct. 26, 1943