

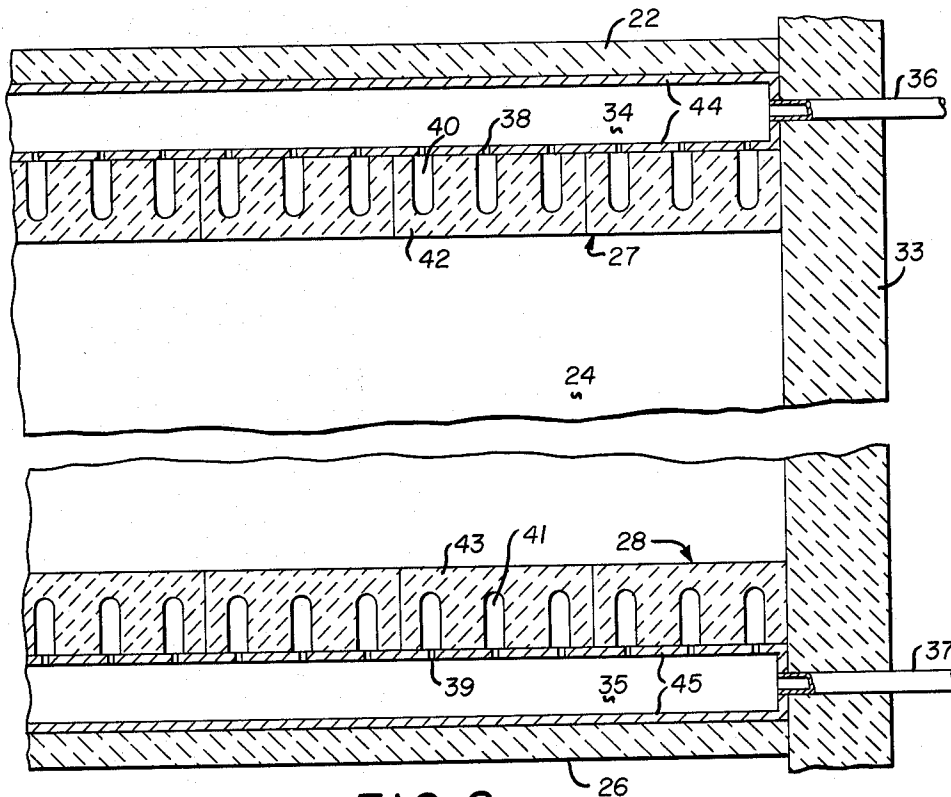
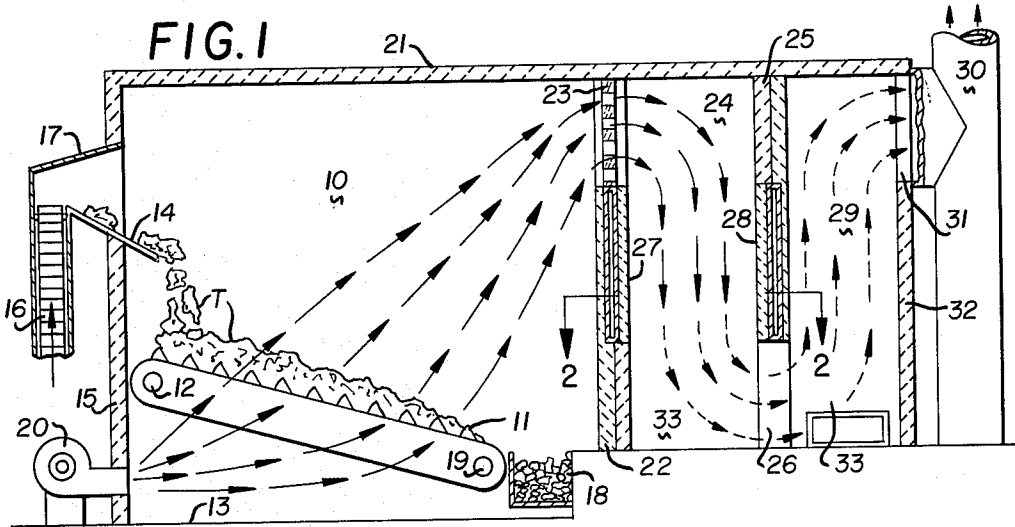
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INCINERATOR WITH AFTERBURNER

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INCINERATOR WITH AFTERBURNER

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5 Claims. (Cl. 110-8)

This invention relates to an incinerator of the type used for disposal of trash, garbage and the like and more particularly to an incinerator incorporating an afterburner for completely consuming smoke and by-products of combustion.

The principal object of the invention is the provision of an incinerator and afterburner therefor that will eliminate all smoke and odor.

A further object of the invention is the provision of an incinerator and afterburner construction in which all of the products of combustion in the incinerator are passed through an afterburner wherein a temperature is maintained sufficient to completely consume said combustion products.

A still further object of the invention is the provision of an incinerator and afterburner which may be located adjacent to or in a residential or business section of a community without creating any nuisance as a result of its operation.

A still further object of the invention is the provision of an incinerator and afterburner construction which may be constructed and operated at reasonable cost.

A still further object of the invention is the provision of an incinerator and afterburner construction in which a luminous radiant porous fire source is used in the afterburner construction for destroying the smoke and odors passed therethrough.

The incinerator and afterburner construction disclosed herein provides an effective answer to a serious problem that exists in practically all cities with respect to the disposal of trash and garbage. Various methods of such disposal have been tried and have been found objectionable. One of the principal methods of trash and garbage disposal has been through the use of incinerators and such devices as heretofore known in the art have produced objectionable smoke and odor.

The present invention combines a trash and garbage incinerator of the conveyor type arranged to operate in conjunction with an afterburner and settling chamber so that all of the products of combustion are directed through the afterburner chamber and the settling chamber. The afterburner chamber comprises a suitably sized chamber, the walls of which are largely formed of radiant heat units so that a temperature of approximately 2100° F. can be maintained in the afterburner chamber to completely consume all smoke and odor from the incinerator. A second portion of the afterburner construction comprises a settling chamber through which the products of combustion are directed so that fly ash and the like can be settled out.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being the intention to cover all changes and modifications of the example of the invention herein chosen for purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

The invention is illustrated in the accompanying drawing, wherein:

FIGURE 1 is a diagrammatic illustration with parts broken away and parts in cross section of an incinerator and afterburner construction.

FIGURE 2 is an enlarged horizontal section on line 2-2 of FIGURE 1.

By referring to the drawings and FIGURE 1 in par-

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ticular, it will be seen that the incinerator and afterburner structure comprises a walled enclosure defining a first combustion chamber 10 in which an endless conveyor mechanism 11 positioned and angularly disposed with respect to horizontal and arranged with its elevated end 12 spaced with respect to the floor 13 of the chamber 10 and beneath a chute 14 extending exteriorly of the chamber 10. The chute 14 extends through an end wall 15 where it communicates with a conveyor 16 which is of the vertical lift type and capable of delivering trash and garbage upwardly into the area adjacent the upper end of the chute 14. The area above the chute 14 and conveyor 16 is enclosed as by a suitable enclosure 17. An ash hopper 18 is positioned adjacent the lower end 19 of the conveyor 11 so that ashes on the conveyor 11 will be delivered into the ash hopper 18 automatically as the conveyor 11 operates.

In FIGURE 1, trash and/or garbage represented by the letter T is deposited on the elevated end 12 of the conveyor 11 and which conveyor 11 is caused to move from left to right as seen in FIGURE 1 while combustion air indicated by the arrows in FIGURE 1 is introduced from a suitable blower 20. The trash and/or garbage T is ignited and burns in the manner of a conventional incinerator construction with the products of combustion including the smoke and odor of the burning refuse indicated by the arrows in the upper portion of the chamber 10 being confined in the chamber 10 by a top 21, oppositely disposed side walls and a partition 22. The partition 22 is positioned beyond the ash hopper 18 and forms an end wall of the chamber 10 open at its uppermost portion where the passageway is restricted by a checker construction 23 to suitably reduce the rate of flow of the products of combustion and to absorb heat energy and continuously redirect the same toward the products of combustion passing therethrough. The checker work 23 may comprise a staggered arrangement of refractory bricks as known in the art. The products of combustion after passing through the checker work 23 over the partition 22 move into an afterburner chamber 24. The top 21 extends across this afterburner chamber 24 and a secondary partition 25 defines an opposite wall thereof which secondary partition 25 has an opening 26 adjacent its lowermost end and of an area equal to the area of the checker work 23 in the opening in the partition 22. Thus, the products of combustion indicated by arrows in the afterburner chamber 24 flow downwardly through the afterburner chamber 24 and between oppositely disposed luminous radiant porous walls 27 and 28 formed on the opposed inner sides of the partitions 22 and 26 and suitably supplied with fuel so that radiant heat energy is produced thereby and directed into the afterburner chamber 24 in an amount sufficient to consume all smoke and odor from said products of combustion. The completely consumed products of combustion as indicated by broken line arrows move through the opening 26 in the secondary partition 25 and into a settling chamber 29 and thence upwardly therethrough and into a flue 30 by way of an opening 31 in an end wall 32. A clean-out door 33 is provided in the bottom of the settling chamber 29 so that fly ash may be conveniently removed therefrom.

It will thus be seen that the incinerator in the incinerator chamber 10 operates under forced draft to consume the trash and/or garbage deposited on the conveyor 11 and moved progressively through the incineration area thereby and the draft introduced from beneath the conveyor 11 fans the fire and builds up a normal operating temperature of approximately 1500° F. in the incineration chamber 10. The products of combustion thus effected include considerable volume of smoke and gases some of which have an objectionable odor and these products of combustion indicated by the arrows in the incinerator

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chamber 10 flow upwardly through the checker work 23 where they are slowed down and then flow downwardly through the afterburner chamber 24 wherein the smoke and gases are completely consumed by the 2100° F. temperature maintained therein by the radiant heat units 27 and 28 which line the opposed walls thereof. The afterburner chamber 24 has oppositely disposed side walls, one of which is seen in FIGURE 1 and indicated by the numeral 33.

By referring now to FIGURE 2 of the drawings, a horizontal section of the afterburner chamber 24 and the radiant walls defining the same may be seen, and it will be observed that the partition walls 22 and 26 directly support structures defining fuel mixing chambers 34 and 35 which are supplied with fuel gas and air through supply pipes 36 and 37 respectively and which mixing chambers have a plurality of spaced orifices 38 and 39 therein arranged so that they communicate with hollow spaces 40 and 41 in a plurality of porous radiant units 42 and 43 respectively. The hollow porous radiant units 42 and 43 are supported by the partitions 22 and 26. The units 42 and 43 are held directly against the orifices 38 and 39 in the mixing chambers 34 and 35 so that the air and gas mixture in the chambers 34 and 35 flows outwardly into the radiant units and ignites inwardly of the surface thereof. The temperature of the radiant units is thus raised to a degree sufficient to produce the desired radiation whereby the temperature in the afterburner chamber 24 is maintained at 2100° F. All of the products flowing therethrough are subjected to said radiant energy from the radiant units 42 and 43 whereby all of the smoke and gases in said products of combustion are completely consumed.

Still referring to FIGURE 2 of the drawings, it will be seen that the air and gas chambers 34 and 35 are defined by jackets 44 and 45 respectively and that the apertures 38 and 39 are formed in the walls of the jackets 44 and 45 adjacent the hollow spaces 40 and 41 in the radiant units 42 and 43.

It will thus be seen that the areas of the radiant walls 27 and 28 within the afterburner chamber 24 are sufficient to provide the necessary afterburner effect to meet the principal object of the invention, and having thus described my invention, what I claim is:

1. The combination of an incinerator and an afterburner for completely consuming the products of combustion originating in the incinerator, said incinerator including grate means in a first chamber, a second chamber, a partition separating said first chamber from said second chamber, a communicating opening between said first and second chambers, said second chamber having

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oppositely disposed walls including hollow porous radiant units, means to supply a mixture of fuel gas and air to said radiant unit, said second chamber comprising said afterburner and an outlet communicating with said secondary chamber.

2. The combination incinerator and afterburner set forth in claim 1 and wherein the opening between the combustion chamber and the secondary chamber is at the top of said partition, and the outlet is in the lower part of said secondary chamber.

3. The combination incinerator and afterburner set forth in claim 1 and wherein said secondary chamber has said outlet opening therein in the lower part thereof and wherein a settling chamber is formed adjacent thereto for receiving and conveying the products of combustion therefrom to a flue through an outlet in the upper part of said settling chamber.

4. The combination incinerator and afterburner set forth in claim 1 and wherein said communicating opening has checker work restriction means incorporated therein and is located in an uppermost portion of said afterburner chamber.

5. A trash and smoke consuming incinerator comprising an enclosure having at least one vertical partition therein defining a pair of chambers on either side thereof, means exteriorly of one of said chambers for introducing trash thereinto and means exteriorly of said trash receiving chamber for directing air thereinto to support combustion therein, hollow porous radiants of the luminous radiant type forming spaced opposed wall areas in said second chamber means for supplying a mixture of fuel gas and air to said hollow porous radiant, a communicating opening between said first chamber and said second chamber, heat exchange checker work in said communicating opening and an outlet in an opposite wall of said second chamber in spaced relation to said communicating opening and a settling chamber adjacent said secondary chamber and in communication therewith and with a flue.

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