United States Patent

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[54] **METHOD AND MEANS FOR INCINERATING SOLID WASTE**
7 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** ..... **110/8 A**
[51] **Int. Cl.** **F23g 5/00**
[50] **Field of Search** ..... 110/8 R, 8 A, 8 C, 18 R, 18 C

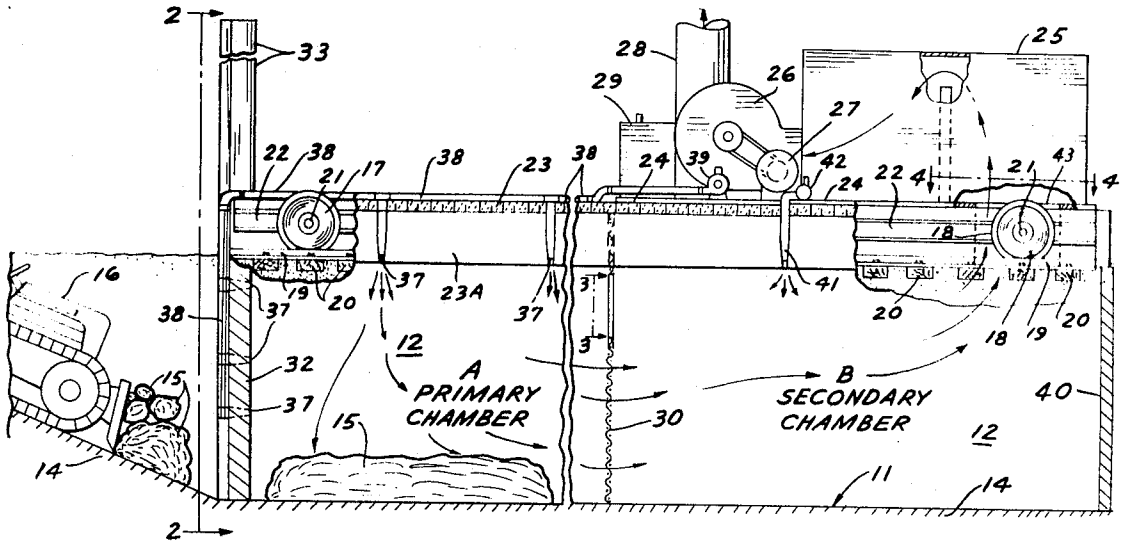
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ABSTRACT: Method and means for disposing of solid waste by using a portable incinerator, in conjunction with a continuous sanitary landfill trench. The method consists of progressively incinerating the waste within the trench with a portable incinerator, and then covering the solid residue, after combustion, with a sanitary landfill. The means consist, in general, of a refractory cap having depending side and end members, which progressively compartmentize areas of the trench with means to sustain combustion in the compartments, means to scrub the combustion gases, and means to move the entire assembly along the trench.



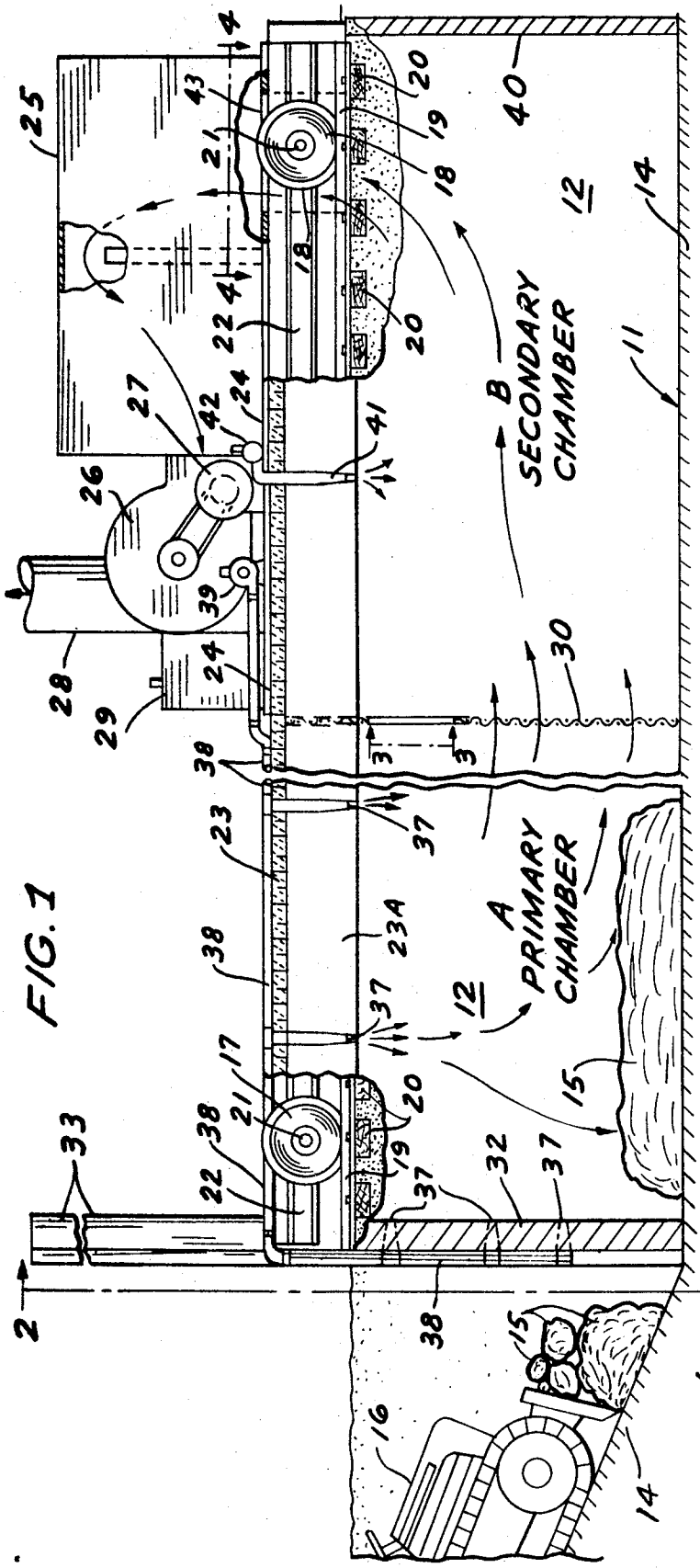


FIG. 1

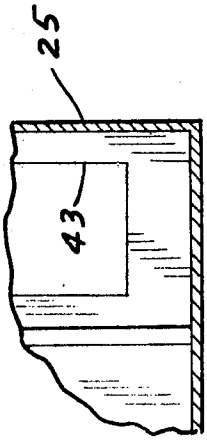


FIG. 4

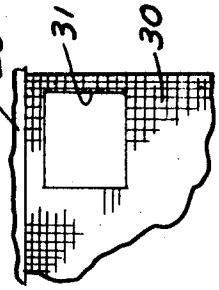


FIG. 3

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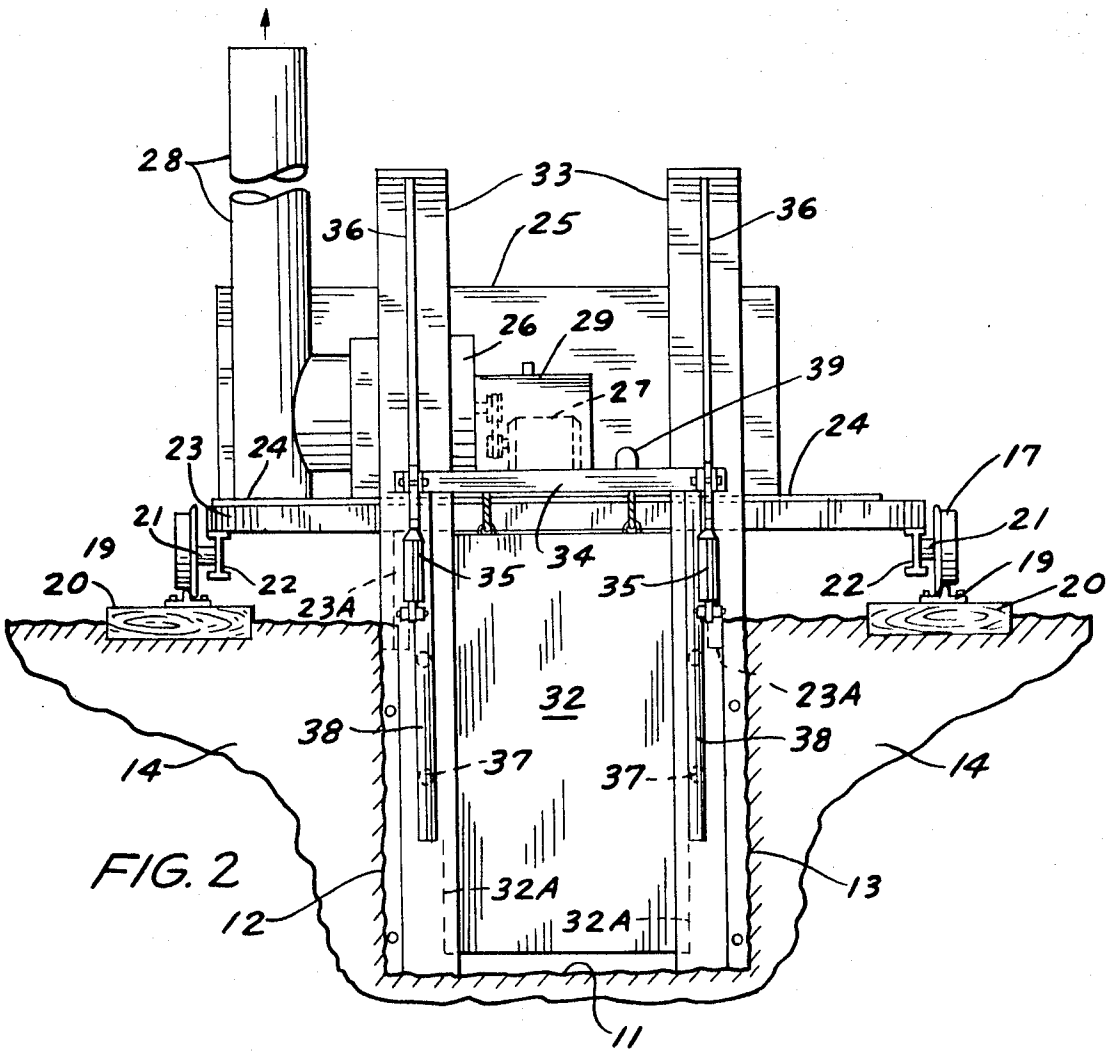


FIG. 2

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METHOD AND MEANS FOR INCINERATING SOLID WASTE

This invention relates to the disposition of solid waste, trash and the like, and embodies the salient features of the two most widely used methods now in use.

Large municipal incinerators are in common use, but present problems of smoke, fly ash, and odor, which damage and offend the properties, health, and sensibilities of the citizens, aside from the costs entailed in the multiple handling of the refuse before the final removal to a sanitary landfill.

Direct burial of the refuse in a sanitary landfill, without pretreatment, entails the use of extensive areas of increasingly valuable land, in and near municipal boundaries. This practice also results in the putrefaction of organic matter which causes the pollution of water by leaching, and the burial grounds encourage the breeding and spreading of vermin and rodents.

It is, therefore, an object of this invention, to obviate the foregoing difficulties, and to provide a method which is economical, practical, and efficient for both large and small communities.

Another object of the invention is to provide a device of the character indicated which is simple in construction, and one which may be built and operated with a minimum of labor.

Another object of the invention is to provide a device of the character indicated which may progressively be used on site locations, or may as readily be transported to other locations.

Another object of the invention is to provide a portable incinerator, which can easily be modified for efficient use on rubbish accumulations of different types.

Another object of the invention is to incinerate waste, so that the residue may be used for on the spot rebuilding and fertilization of submarginal land.

Another object of the invention is to permit even small local governmental bodies to make use of certain equipment which they already have on hand for waste disposal purposes.

The foregoing and other objects and advantages of the invention will become more apparent as the description proceeds, reference being made from time to time to the accompanying drawings, forming part of the within disclosure, in which drawings:

FIG. 1 is a longitudinal section with parts broken away, taken through a device embodying the invention.

FIG. 2 is an end, elevational view, taken substantially on the line 2—2 of FIG. 1.

FIG. 3 is a fragmentary detail, taken substantially on the line 3—3 of FIG. 1.

FIG. 4 is a fragmentary, horizontal section, taken substantially on the line 4—4 of FIG. 1.

Referring now more particularly to the drawings, it will be understood that in the embodiment herein disclosed, the reference character 11 indicates the bottom wall, and the reference characters 12 and 13 indicate the sidewalls of a trench, which has been excavated in the ground 14, in which is to be processed an accumulation of rubbish 15, with the equipment embodying the invention. The rubbish 15 may be moved into the end of the trench by means of a conventional tractor 16, or the rubbish 15 may be dumped into the trench from the sides, by dump truck or other suitable means. The trench may be of any desired length, and may vary in width from 12 to 16 feet and have a depth from 8 to 10 feet. However, I do not intend to be limited by these dimensions, as they are simply suggestive.

After the trench is excavated and charged with a suitable depth of rubbish 15, the device embodying the invention is assembled and moved in position over the trench The device embodying the invention is supported on pairs of flanged wheels 17 and 18, which travel on rails 19, which are supported on the comparatively short crossties 20. The ties 20 are supported on top of the ground 14, on either side of the trench. The economical practice is to extend the trench to the maximum length of the ground area being used as a fill. The rails 19 and the ties 20 may likewise be extended to any desirable length. The assembly may be transported over the rails by any suitable propulsion means, such as a tractor, or the device may be equipped with its own automotive propulsion system (not shown.) It will be understood however, that the forward movement of the device is dependent only on the capacity of the primary chamber 12 and will be at a comparatively slow rate of travel.

The wheels 17 are supported on axles 21, which are mounted on longitudinally directed eyebeams 22. Supported on the eyebeams 22 is a multiplicity of refractory elements 23, which constitute the cap of the device. The refractor elements 23 are conventional products found on the open market, and are tied together, as in conventional practice, to make an airtight cap for the device. A cover plate 24 is positioned on top of the refractory elements 23, and serves as a mounting base for a commercial gas scrubber 25, blower 26, motor 27, and stack 28. The motor 27 may be driven by connection to a conventional electric power outlet, or may be driven by a gasoline motor driven generator assembly 29 (FIG. 1), which also may be used to drive a conventional air compressor and hydraulic pump for the equipment, hereinafter described. Depending along either side of the metal plate 23 are high- temperature refractory skirts 23A. The skirts 23A extend into the trench, a sufficient distance below the level of the ground, so that they form seals along the upper walls of the trench and assist in the formation of primary and secondary combustion chambers A and B, as hereinafter described. The primary and secondary combustion chambers A and B are divided by means of a steel screen 30, which is suspended by any suitable means from the bottom of the refractory cap 23. The screen 30 has an opening 31 (FIG. 3) to permit the rapid escape of smoke and gases, and to aid combustion The primary combustion chamber A is closed at the charging end of the trench by means of a heavy metal door 32, which may be elevated and lowered in suitable guides 32A, formed in the end pillars 33. The door 32 is suspended on a yoke member 34, which is raised and lowered by means of double-acting hydraulic cylinders 35. The yoke 34 has members which travel in guides 36, formed in the pillar members 33. The hydraulic cylinders also serve to hold the door 32 in elevated position, when it is desired to charge the combustion chamber from the end of the trench, or when the device must be transported over the rails 19.

The primary combustion chamber A is provided with a plurality of air intakes 37, which are connected to air lines 38, which are in turn connected to the air compressor 39. The compressor 39 serves to supply the primary combustion chamber with a sufficient volume of air under pressure, to sustain good combustion. The products of combustion are exhausted through the opening 31 in the screen 30, and enter the secondary combustion chamber B, and are ultimately withdrawn from the secondary chambers, as hereinafter described.

The secondary combustion chamber B is defined at one end by the heavy screen 30, and at the other end by means of a metal plate 40, which is preferably hinged at the top, and maybe elevated by any suitable means when the assembly is to be transported to a new position. The secondary combustion chamber B is provided with a charge of natural gas or oil, through the nozzles 41, which may come from commercial pipelines, which are connected to the blower 42 through flexible tubing or the like, or the gas, or oil supply, may be carried in suitable containers integrated with the assembly. The final products of combustion are withdrawn from the secondary combustion chamber B through an opening 43 formed in the cap 23. The gases then pass through a conventional commercial scrubber 25, and are pulled through the blower 26, and hence exhausted to the atmosphere through the stack 28.

When ash and residue of combustion interferes with good combustion, the device is then advanced to a new position, and that part of the trench is then covered with soil.

It is believed that the operation of the device is obvious from the foregoing description.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. A structure of the character described, including a continuous trench, comprising a refractory cover for a section of said trench, refractory skirts depending from said cover coextensive with the sides of said section, walls defining the ends of said section, means for inducing combustion in said section, antipollution means for treating the products of combustion, and means for transporting the assembly over and along said trench.

2. The structure of claim 2, in which said end walls are adjustable with respect to said cover, one of said end walls being arranged to open, for charging waste into said trench.

3. The structure of claim 3, including a flexible metal screen depending from said cover midway between said end walls and arranged to divide said section into primary and secondary combustion chambers, said screen having at least one opening therein for communicating one of said chambers with the other.

4. The structure of claim 1, including means for adjusting at least one of said end walls.

5. The structure of claim 3, in which said primary combustion chamber is provided with a plurality of air openings and means to force air under pressure into said chamber through said openings.

6. The structure of claim 3, in which said primary combustion chamber is provided with openings for receiving air under pressure and said secondary combustion chamber is provided with at least one opening for charging said last-named chamber with combustible fuel under pressure.

7. The structure of claim 3, in which said secondary combustion chamber has an opening for exhausting therethrough products of combustion.