March 5, 1963 L. A. VARGO, JR., ETAL 3,079,878

INCINERATOR

Filed Jan. 19, 1959

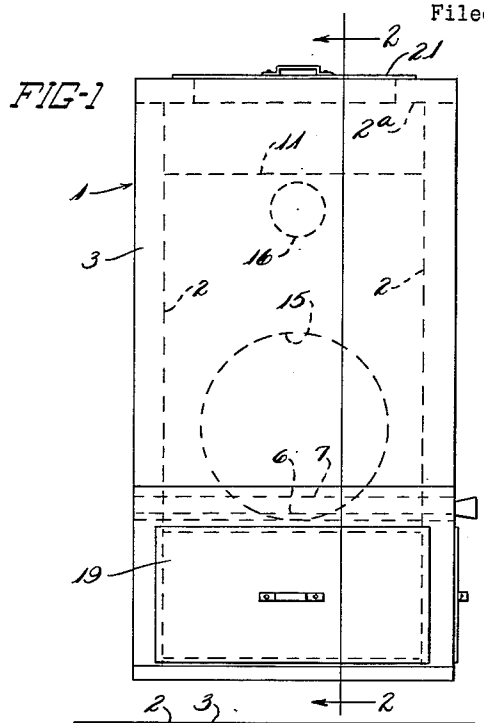


FIG-1

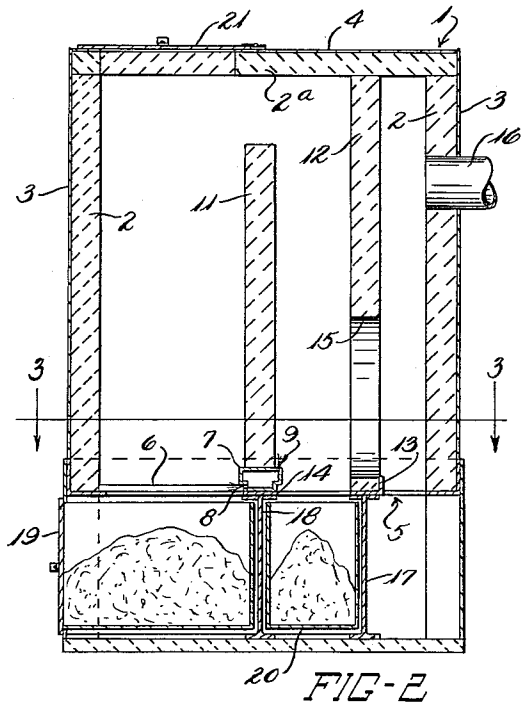


FIG-2

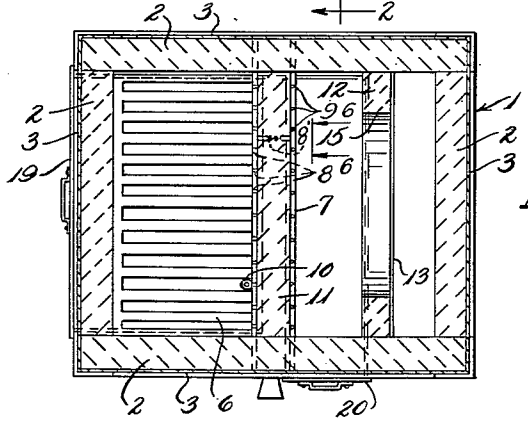


FIG-3

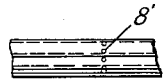


FIG-6

FIG-5

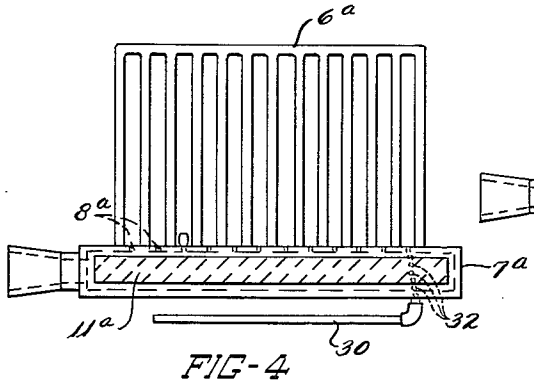
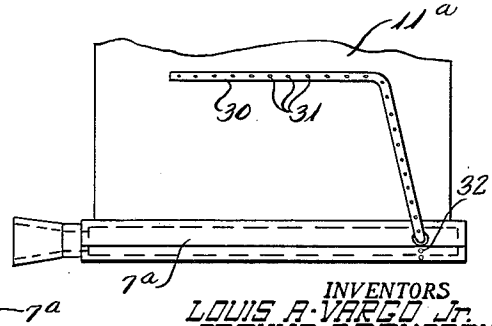


FIG-4



INVENTORS
LOUIS A. VARGO Jr.
ARTHUR BETHARDY
BY Bosworth, Sessions, Herrstrom & Knowles
ATTYS.

United States Patent Office

3,079,878

Patented Mar. 5, 1963

3,079,878

INCINERATOR

Louis A. Vargo, Jr., 2801 E. 126th St., and Arthur Bethardy, 3026 E. 125th St., both of Cleveland 20, Ohio

Filed Jan. 19, 1959, Ser. No. 787,690

5 Claims. (Cl. 110—8)

This invention relates to incinerators and more particularly to incinerators adapted for use in residential areas.

Many different types and styles of incinerators have been provided for both industrial and residential use. Difficulty has been experienced, however, in providing an effective, low cost incinerator which fully and completely consumes all of the combustible material placed therein and is therefore adapted for general use including use in residences and residential areas. Thus prior art incinerators have frequently permitted sufficient unconsumed and partially burned particles or fragments of material and objectionable smoke to pass from the incinerator to produce undesirable odors or otherwise be objectionable to the user, neighbors and community.

It is therefore a general object of this invention to provide a new and improved type of an incinerator characterized by its ability to consume, completely, all materials placed therein prior to exhaustion of the combustion products and/or gases from the incinerator.

Other objects of this invention include the provision of an incinerator adapted for residential and other use which is efficient and foolproof in operation, which is economically manufactured and used, which is portable; and which is odor free and eliminates deleterious effects on the surrounding area due to noxious exhaust gases.

Still other objects of this invention include the provision of a portable incinerator adapted for residential and other uses which burns both the material placed in the incinerator for combustion and the gases produced on initial combustion, which includes means to control gas flow to provide dual ash collection zones; which has a grate including primary and secondary burner means formed integrally therewith and adapted to be ignited via a common source; and which includes ceramic insulating walls for maintaining the outer surface of the incinerator at a moderate temperature even during combustion.

The means for obtaining these and other objects and advantages of this invention will become apparent from the following description of a preferred and modified form of this invention, reference being had to the accompanying drawings, in which:

FIGURE 1 is a front elevation of an incinerator embodying this invention;

FIGURE 2 is a vertical section viewed along the line 2—2 of FIGURE 1;

FIGURE 3 is a horizontal section viewed along the line 3—3 of FIGURE 2;

FIGURE 4 is a plan view of a grate and burner embodying a modified form of this invention and adapted for use in the incinerator shown in FIGURE 1;

FIGURE 5 is a side elevation of the grate and burner shown in FIGURE 4; and

FIGURE 6 is a fragmentary vertical section viewed along the lines 6—6 of FIGURE 3.

Broadly, incinerators embodying this invention include a chamber forming means, a grate positioned in the chamber and spaced from the bottom thereof, a baffle wall extending up from the grate and terminating in spaced relation with the top of the chamber and defining the rear wall of a combustion chamber, a baffle positioned in the chamber and laterally spaced from the baffle wall and the grate and extending generally parallel to the baffle wall from the top of the chamber to a plane defined by the grate having an aperture adjacent its

lower end through which all gases pass in leaving the combustion zone of the incinerator, and chimney means operatively connected to the aperture in the baffle. Such incinerators also include primary burner means formed integral with the grate in the combustion chamber and secondary burner means disposed intermediate the baffle and the baffle wall and above the plane of the grate for burning the material, including smoke and gases, passing from the combustion chamber and through the space between the baffle and baffle wall.

An incinerator embodying this invention is indicated generally at 1 and includes a substantially rectangular structure made from ceramic walls 2 that extend the height of the incinerator 1 and a top 2a. The incinerator 1 is finished by securing sheet metal outer walls 3 and a top 4 over the ceramic walls, to form the primary structural support and frame of the incinerator. An inner, lower support frame or base 5, conveniently made from conventional metal angles, is provided to support the ceramic walls 2 in proper operative position in incinerator 1.

In order to consume the material to be disposed of and combusted a grate 6 is supported on base 5. Grate 6 preferably includes and is formed integrally with a gas supply manifold 7, which manifold is of generally rectangular shape in cross section, albeit the grate and manifold may be formed separately if desired and the incinerator embody other parts and portions of the invention. As indicated in FIGURE 2 of the drawings, the opposed edges on the bottom portion of manifold 7 are undercut and the grate 6 is secured to the lower portion of the manifold 7 at one margin thereof, or is formed integrally therewith in any conventional manner, as desired. It will be noted that a plurality of gas outlets or jet ports 8 are provided in the base of the manifold 7 and with such outlets 8 being positioned intermediate the bars of the grate 6 and being protected by the overhanging portion provided on the manifold so that any refuse or other material positioned on the grate bar does not fall into or otherwise block these outlets 8. It should be noted that the manifold 7 also has a second series of gas outlets 9 provided in the upper, opposite side thereof from the outlets 8 for a reason to be explained hereinafter in more detail. It will be realized that any desired type of pilot member, indicated at 10, can be provided in association with the gas supply manifold 8 and it will be connected in a conventional manner. Hence this pilot 10 can be controlled automatically, or manually, as desired, and be lit for starting combustion in the incinerator 1. Also, if desired, manifold 7 can be extended so as to provide gas outlets at the forward side, leftward as viewed in FIGURE 2, of the grate. In order to provide a combustion chamber and an after combustion chamber wherein the gases and material resulting from initial combustion are reburned to destroy odors and other noxious matter, incinerator 1 includes a bridge wall or baffle 11 preferably made from ceramic material and supported on the upper surface of the manifold 7 and suitably secured to walls 2. Bridge wall 11 terminates appreciably below and spaced from the top of the enclosure formed by the ceramic walls 2 so that smoke, flame, gases and other materials arising from the ignition of any material position on the grate 8 in the main combustion chamber can flow up towards the top of the incinerator 1, over the bridge wall 11, and down the opposite side thereof from the grate 6. A suspended arc wall or baffle 12 likewise preferably made from a suitable ceramic material is secured to and extends between the enclosure formed by the ceramic walls 2 and top 2a. The baffle 12 extends down and is supported on a cross angle 13 provided in frame 5. A support bar 14 is preferably provided to aid in supporting the

manifold 7, grate 6 and associated means on the frame 5. A gas exhaust outlet or opening 15 is provided in the arc or baffle wall 12. Thus gases produced in the incinerator 1 must flow up over the bridge or baffle wall 11 down between the two walls 11 and 12 and through the opening 15 to the back portion of the incinerator for exhaust through a suitable flue 16.

As stated above, the secondary outlets 9 are positioned on the opposite side of the baffle or bridge wall 11 from the main portion of the grate 6. Thus a secondary burning action and second combustion chamber is provided on the particles of material and fly ash passing up over the bridge wall 11 and coming down along the opposite side thereof. This makes possible the attainment of the desired complete combustion action on all material in the incinerator 1 including material which is carried from the main combustion chamber by and/or as a part of the combustion gases. Outlets 9 are lit from outlets 8 by suitable means, such as outlets 8' extending transversely of the manifold.

Preferably separation or partition walls or channels 17 and 18 are provided underneath the support angle 13 and cross bar 14, respectively, to maintain the grate 6 and combustion area provided thereabove separate from the secondary combustion area provided in the part of the incinerator 1 intermediate the baffle walls 11 and 12. Hence one ash drawer, or ash pit 19 can be provided underneath the grate 6 for removing ash therefrom and a second ash drawer or ash pit 20 is provided in the portion of the incinerator 1 intermediate the baffle walls 11 and 12 so that fly ash and other ash accumulating therein can readily be removed from the incinerator. It also should be noted that the exhaust opening 15 is appreciably above the bottom portion of the secondary combustion chamber in the incinerator so that it permits small ash particles to settle from the combustion gases before exhausting them from the incinerator.

A suitable size charging door 21 is provided in the top portion of the incinerator so that any desired material can readily be thrown onto the grate 6 for combustion action.

The various ceramic wall components of the incinerator 1 are conveniently cast or molded of a mixture and are cemented or otherwise secured together with a tongue and groove joint to provide a sturdy, gas-tight structure. Also, the sheet metal walls 3 may be spaced from the ceramic walls 2 in order to provide an insulating space between the ceramic and metal walls to aid in maintaining the outer surface of the incinerator cool.

A grate and burner embodying a modified form of this invention is shown in FIGURES 4 and 5 and it includes a grate 6*a* and a manifold 7*a*. The manifold has gas jets 8*a* therein and it supports a baffle 11*a* thereon. In this instance, a secondary burner 30 is provided and is carried by the manifold 7*a* on the opposite side thereof as the grate 6*a*. Secondary burner 30 has gas outlets 31 therein and it extends upwardly from the manifold into the secondary combustion chamber so as to ensure that the gases and material passing therethrough are ignited and burned by the flame issuing from the outlets 31. The burner 30 preferably is lit from the manifold jets 8*a* as by jets or outlets 32 provided in either the top or bottom of the manifold 7*a* and extending transversely thereof.

Alternatively the grate 6 and manifold 7 can be made as separate units where it is necessary to make the manifold and burner unit removable.

Changes and modifications to the preferred and modified forms of the invention herein particularly illustrated and described will occur to those skilled in the art who come to understand the principles and precepts thereof. Accordingly, the scope of this patent should not be limited to the specific forms of the invention herein specifically

disclosed and described but by the advance by which the invention has promoted the art.

It is intended that the patent shall cover, by suitable expression in the appended claims, whatever features of patentable novelty reside in the invention.

We claim:

1. In an incinerator, an inner base frame, ceramic enclosure means carried by said frame and including a lower end and opposed side walls, a manifold and grate unit carried by said frame and disposed within the lower end of said ceramic enclosure means, and having horizontally spaced burner means portions, and a ceramic baffle plate positioned on said manifold and grate unit intermediate said burner means portions and extending between opposed side walls of said ceramic enclosure means.

2. The incinerator according to claim 1 in which said manifold and grate unit has manifold and grate portions, said manifold portion has a recessed lower edge adjacent said grate portion and one said burner portion comprises burner orifices disposed within said recessed lower edge.

3. In an incinerator, enclosure means and manifold means disposed in said enclosure means, a grate positioned at one side of said manifold means, a baffle wall extending upwardly from said manifold means, a primary combustion zone above said grate and on one side of said baffle wall and a secondary combustion zone on the other side of said baffle wall, said combustion zones being defined laterally by said enclosure means and said baffle wall, said manifold means including primary burner means on said one side of said baffle wall and secondary burner means in said combustion zone.

4. The incinerator according to claim 3 in which the portion of said enclosure means which cooperates with said baffle wall to define said secondary combustion zone includes a wall defining other baffle means extending parallel with and laterally offset from said baffle wall, said other baffle means has an exhaust opening no lower than the level of said grate, and said incinerator includes means providing a substantially dead air zone at the lower portion of said secondary combustion zone below the level of said grate.

5. A portable incinerator comprising chamber forming means, substantially flat grate means positioned in said chamber and spaced from the bottom thereof, a baffle wall extending upwardly above said grate means and having an upper edge spaced from the top of said chamber, a baffle in said chamber and spaced laterally from said baffle wall and extending downwardly from the top of said chamber, said baffle wall and part of said chamber forming means defining a first combustion chamber above said grate means, said baffle wall, baffle and intermediate portions of said chamber forming means defining a second combustion chamber, an exhaust opening in said baffle adjacent the lower end of said second combustion chamber, an ash pit beneath said first combustion chamber, a second ash pit beneath said second combustion chamber, means separating said ash pits, chimney means connected to said exhaust opening, said grate means including primary burner means disposed in said first combustion chamber and secondary burner means disposed in said second combustion chamber, said secondary burner means being ignited by said primary burner means.

References Cited in the file of this patent

UNITED STATES PATENTS

1,194,385	Hoover	Aug. 15, 1916
1,995,893	McEver	Mar. 26, 1935
2,678,009	Blum et al.	May 11, 1954
2,711,139	Martin	June 21, 1955
2,929,342	Young	Mar. 22, 1960