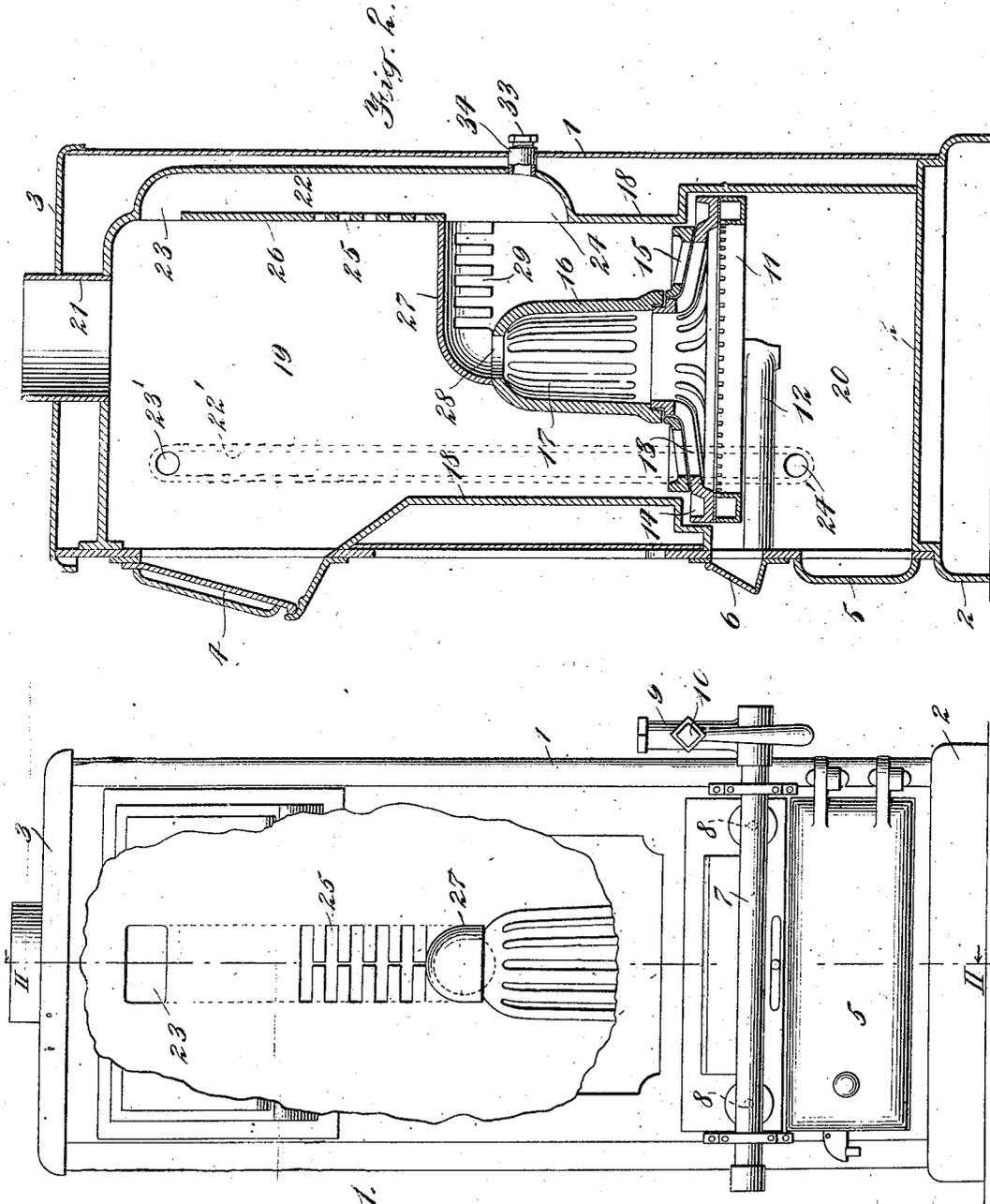


O. M. SHANNON.
 INCINERATING APPARATUS.
 APPLICATION FILED JAN. 17, 1912.

1,218,325.

Patented Mar. 6, 1917.
 3 SHEETS—SHEET 1.



Witnesses:
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W. A. P. Hudson

Fig. 7.

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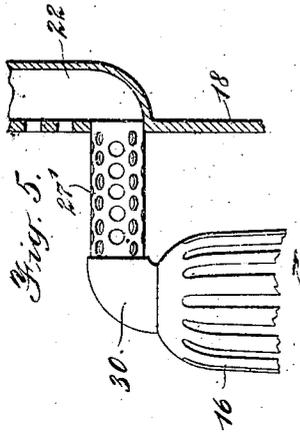


Fig. 5.

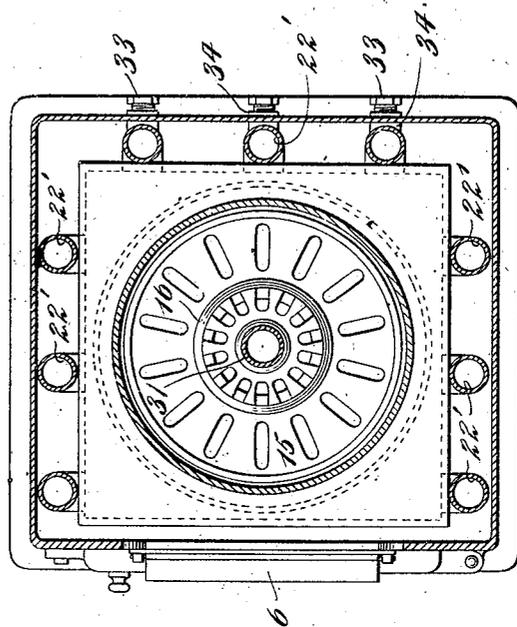


Fig. 7.

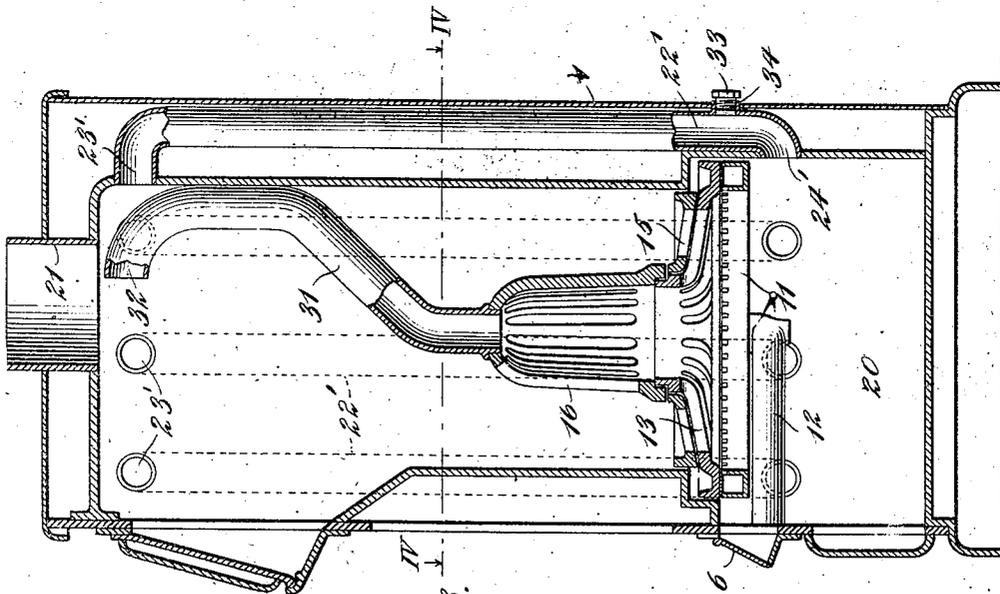


Fig. 3.

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UNITED STATES PATENT OFFICE.

OSCAR M. SHANNON, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO
E. C. STEARNS & COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW
YORK.

INCINERATING APPARATUS.

1,218,325.

Specification of Letters Patent.

Patented Mar. 6, 1917.

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To all whom it may concern:

Be it known that I, OSCAR M. SHANNON, a citizen of the United States, residing at the city of New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Incinerating Apparatus, of which the following is a full, clear, and exact description.

This invention relates to crematories, incinerators or furnaces adapted to burn and dispose of refuse of various sorts.

In my Patents Nos. 964,568 and 981,228, I have shown and described certain forms of furnaces of this description, and the mode of operation of the herein described structures is in certain respects analogous to those set forth in the said patents.

For certain uses, however, and for cheapness of construction, the present apparatus is preferable. The differences in construction between my patented devices and those herein described will be hereinafter pointed out together with the objects sought, and the novel elements and combinations of elements whereby said objects may be attained, and which enter into the present construction will be more particularly set forth in the claims appended hereto.

Referring to the drawings which form a part hereof and in which like reference characters designate like parts throughout the several views:

Figure 1 is a front elevation, partly broken away, of a garbage crematory embodying my invention.

Fig. 2 is a section of the same taken on line II—II of Fig. 1 parts being omitted for clearness.

Fig. 3 is a similar section of a modification.

Fig. 4 is a transverse section taken on the line IV—IV of Fig. 3.

Fig. 5 is a detail of a modification of the structure shown in Fig. 2.

Fig. 6 is a vertical section similar to Fig. 2, but of still another modification.

Referring first to Figs. 1 and 2, a casing 1 of any suitable description is provided with a base 2 and a top 3. In the front is a door by means of which garbage may be introduced into the receptacle provided in the casing. At the bottom of the casing, below the door 4, in an ash door 5 and a re-

movable plate 6 disposed thereabove affords access to the burner hereinafter referred to. Across the front of the casing is a tube 7 which has been omitted from Fig. 2 together with certain other parts, for clearness of illustration, tube 7 being apertured as at 8 upon the side thereof adjacent the front of the casing to form vents for gas. Gas is led into this tube 7 via a connection 9; the flow of gas being controlled by a cock 10. The purpose of this construction is to provide pilot flames for igniting the gas or other combustible delivered to the burner 11. This burner may have the form of a notched or slotted channel, fuel being delivered thereto through a pipe or pipes 12. As this feature has already been considered at some length in my said Patent No. 981,228, it will not be herein further discussed.

Above the burner 11 is a normally stationary grate 13 which may have a channel or gutter 14 therearound, if desired; and above this grate is a revoluble or otherwise movable grate 15. I prefer to cone both of these grates in the manner shown, but do not wish to be limited to such construction. The grate 13 carries a dome 16, the sides of which are slotted as at 17, to form a grate surface. Within the outer casing 1 is an inner casing 18, the walls of which together with the grates and doors respectively form the incinerating chamber broadly designated 19, located above the grate, and the ash pit 20, below the latter. A flue 21 extends upwardly from the top of the incinerating chamber in the usual manner and opens into a chimney.

In this form of my device the rear wall of the inner casing is recessed to form a conduit 22 which opens into the upper part of the incinerating chamber at 23 and into the lower part of the same at 24. In addition to these openings, apertures 25 may be provided in the wall 26 which separates conduit 22 from the incinerating chamber; openings 25 being preferably elongated slots arranged in parallelism to form a grating. A cross or laterally directed member connects the opening 28 in the top of the dome 16 with the conduit 22. In the form of device shown in Fig. 2, member 27 has substantially the form of an inverted U, in cross section, the sides thereof being also slotted or grated as at 29. When the garbage, or other material

to be incinerated, is introduced into the chamber 19, it falls down onto the grate and stacks up around the member 27, but this member serves to maintain communication
 5 open between the dome, which, of, course, is directly in connection with the space below the grate and the conduit 22, since the material to be incinerated cannot flow up into the space within or directly beneath the cross
 10 member. The parts 16, 22, and 27 form in effect a flue which is designated the main flue.

Referring to Fig. 5, I have therein shown a modification of this portion of the device,
 15 member 27 being replaced by a perforated or reticulated tubular member 27', which is connected to the top of the dome 16 by means of a suitable pipe fitting 30, and the other extremity of which opens directly into
 20 the conduit 22. It may be here stated that the conduit 22, together with the member 27, or the like, and the dome, constitute a means for delivering air directly from the
 25 under side of the grate to the top of the incinerating chamber which has been designated, and it will be noted that by reason of the disposition of the opening 23 the stream of air so flowing into the incinerating chamber must first mix thoroughly with
 30 the noxious gases generated and delivered to the upper portion of the incinerating chamber, before the said air or gases pass up through the flue 21 which extends into the chimney.

In the structure or device illustrated in
 35 Fig. 1 of my Patent 981,228, there was provided this form of flue, but this flue did not have the sides thereof perforated, while the top thereof was directed upwardly toward
 40 the chimney flue, so that this mixing action between the incoming air and the gases of combustion did not occur until the said gases and air had passed up into the chimney flue.

There are also certain advantages in providing grate openings 25 in the walls of
 45 this flue; in that they tend to favor combustion throughout the body of the mass of matter to be incinerated; serving to permit the smoke and carbon monoxid, carbon
 50 dioxid, etc., to escape laterally from such portions of the mass, and thereby facilitating combustion. It will be noted also that the conduit 22 opens directly into substantially
 55 the bottom of the incinerating chamber, which further aids this action. The flames from the burner 11 pass radially inward over the lower surface of the grate in this form of my device and up into the dome.
 60 Indeed when the flame is turned on full, these flames will also pass upwardly through the opening 23 and laterally through the member 27. Thus the matter within the incinerating chamber is attacked from below,
 65 internally and upwardly through the center

of the mass, and laterally as well, resulting in a very expeditious incineration of the same. If comparatively fresh air be not permitted to enter the upper part of the chamber the gases of combustion, especially
 70 from certain substances which may be consumed in my furnace, generate most offensive odors and are furthermore deleterious to health. The admission of air in the manner described therefore is of very great
 75 importance, in that thereby these gases are promptly destroyed or converted into harmless and substantially inodorous compounds.

Of course the flames licking up into the interior of the dome will consume a portion
 80 of the oxygen content of the air delivered to the main flue, but the admission of air is so much larger by reason of the diameter of the dome that this loss is not detrimental to any material degree. In fact, certain
 85 advantages result from this construction, in that the air is preheated to quite a high temperature before being delivered into the incinerating chamber.

If desired auxiliary flues 22' may also be
 90 provided in this construction; but as the function and construction of these parts will be more fully discussed in connection with Figs. 3 and 4, I shall next consider these
 95 figures. Many portions of the structure therein shown are closely similar to those just described, and hence will not be again referred to at length. The incinerating chamber walls are preferably spaced from
 100 the outer casing, as in the preceding case, and around said chamber, in this space are a plurality of the auxiliary flues 22', which in this instance are tubular, and disposed so as to deliver air into said chamber at a
 105 plurality of points. The operation of these auxiliary flues is much the same as in the case previously discussed, the air delivered therethrough being of course somewhat preheated by reason of the adjacency of the
 110 flames issuing from the burner 11 to the mouths 24' of said conduits; said mouths it will be observed, in this case, being located below the grates rather than above the same. The openings 23' are preferably,
 115 although obviously not necessarily, laterally directed as in the preceding case, so that the air is thoroughly mixed with the gases of combustion before the latter pass into the
 120 flue 21. In this case I have also provided a dome 16 from the upper extremity of which extends an additional conduit 31, which corresponds in many respects to the member 27
 125 and conduit 22, previously referred to, but which in this case is imperforate and extends upwardly and somewhat laterally toward the top of the furnace, the extremity 32
 130 thereof being laterally directed with respect to the chimney flue 21. It will be noted too that in providing thus a number of auxiliary flues 22', the cross-sectional area of the same 130

is made smaller than such a flue as that designated 22, in Fig. 2, since it is inadvisable to introduce an excess of air into the upper portion of the incinerating chamber.

5 If desired, air may be admitted to the incinerating chamber, in the upper portion thereof, directly from the outside, and to this end plugs 33 may be tapped into extensions 34 of the auxiliary flues which project outwardly therefrom through the walls of the outer casing. Of course, when the plugs 33 are withdrawn from their engagement with projections 34, air will be drawn into the incinerating chamber directly from these openings.

15 Referring to Fig. 6, I have shown a still further form of my device wherein the main conduit 22' forming the main flue passes downwardly below the grate as in the case of the auxiliary flues 22'; while it is built into the interior casing and forms part thereof as in the form of flue shown at 22 in Fig. 2. The wall of flue 22' may be also, of course, grated or perforated at 25, as in the last mentioned form of device. In this form of device the grate 35 is flat instead of being coned, as in the preceding cases. Herein too a further slight difference is found, in that in place of disposing the burner below the grate, as in the preceding case, it is located above the same. In this instance the burner consists of a pipe 36, perforated as at 37, to afford jets of flame, which latter impinge against the under surfaces of a shield 38. This shield may be of angle-iron, or the like, and serves to protect the burner from the refuse or garbage introduced into the incinerator, the flames from the burner glancing downwardly and more or less through the apertures in the grate 35, as indicated by the arrows, draft being maintained, when the incinerating chamber is full, through the conduit 22' for the main flue and the auxiliary flues 22', as in the preceding cases. Ultimately, after the device has been in operation for some time the flames will have eaten their way laterally around the bottom of the mass of refuse and from time to time this mass will shake itself down. It may be here stated that this action best occurs, I find, where the material to be incinerated is not subject to clinkering to any material degree. This form of device may be useful, however, where the refuse is readily combustible and relatively light in character, and I regard this arrangement as clearly within the purview of my invention. It will be observed also that the shield 38 is so formed that the upper sides thereof which are normally in engagement with the refuse, slope downwardly so as to aid downward movement of the latter through the incinerating chamber.

65 In so far as the positive lateral directing of the flames is concerned, the action of the

cross member (27 or 27') and the shield or screen 38, are analogous, since while in Fig. 2 the burner is below rather than above the grate, nevertheless the directing and deflecting means (16—27) project the flames laterally into the mass to be incinerated in a somewhat similar fashion to that illustrated in Fig. 6. I regard the arrangement shown in Fig. 2, for example, however, as preferable in most cases.

Having described my invention, I claim:

1. In a crematory, a casing having a combustion chamber therein adapted to receive and hold the matter to be incinerated, said chamber having a grate in the bottom thereof, a burner adjacent said grate, a flue affording a passageway from the space beneath the grate to the chamber of the incinerator above the normal level of the mass of material in the chamber, said flue opening directly into said chamber so that the hot gases from the burner may effectually mix with the gaseous products of partial combustion before the latter emerge into the chimney, and an auxiliary flue for supplying a stream of air to the chamber above the normal level of the mass of material therein to insure the complete consumption of the gaseous products of partial combustion before the latter emerge into the chimney.

2. In a crematory, a combustion chamber adapted to receive matter to be incinerated, said chamber having a grated bottom and a flue leading to the chimney, a main flue communicating with said chamber and with the space beneath the grated bottom, an auxiliary flue delivering air into the said chamber at a point above the matter to be incinerated so that air delivered through said flue may mix with the gaseous products of partial combustion before the latter emerge from said chamber, a burner, shielding means opening downwardly for directing flames from said burner laterally with respect to the mass of material to be incinerated, said shielding means adapted to engage and support a portion of said matter while permitting flames passing therebeneath to impinge upon said matter, said main flue having vents in the sides thereof opening into said chamber.

3. In a crematory, a combustion chamber adapted to receive matter to be incinerated, said chamber having a grated bottom and a flue leading to the chimney, a main flue communicating with said chamber and with the space beneath the grated bottom, an extended auxiliary flue adjacent a side wall of said chamber and delivering air into said chamber at a point above the matter to be incinerated so that air delivered through said flue may mix with the products of partial combustion before the latter emerge from said chamber, a burner, shielding means opening downwardly for directing

flames from said burner laterally with respect to the mass of material to be incinerated, said shielding means adapted to engage and support a portion of said matter while permitting flames passing therebeneath to impinge upon said matter.

4. In a crematory, a combustion chamber adapted to receive and hold matter to be incinerated, said chamber having a grated bottom, a flue extending into the chimney, a burner adjacent said grated bottom, a main flue having its upper portion directed laterally into the chamber and having an opening adjacent the burner, a portion of the walls of the main flue being perforated at least one auxiliary flue adjacent the side wall of said chamber adapted to deliver air laterally into the chamber above the normal level of the material to be incinerated, so that the air from the main and auxiliary flues may effectually mix with the gaseous products of combustion in said chamber before the latter emerge from the chamber.

5. In a crematory, a combustion chamber

adapted to receive and hold matter to be incinerated, said chamber having a grated bottom, a flue extending into the chimney, a burner adjacent said grated bottom, a main flue in communication with the chamber and having an opening adjacent the burner, a portion of the walls of the main flue being perforated, at least one auxiliary flue adjacent the side wall of said chamber adapted to deliver air into the chamber above the normal level of the material to be incinerated, said flues directing the air laterally into said chamber so that it may effectively mix with the gaseous products of combustion in said chamber before the latter emerge from the chamber, said auxiliary flue having means for drawing air from the exterior of the crematory.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

OSCAR M. SHANNON.

Witnesses:

WALDO M. CHAPIN,
CHAS. P. HIDDEN.