Dec. 26, 1950 H. H. HATHAWAY 2,535,206

INCINERATOR

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Fig. 1.

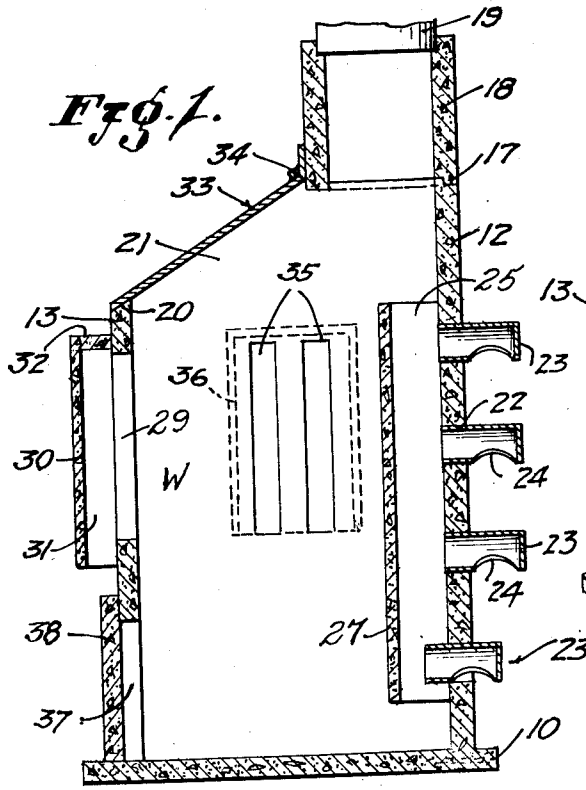


Fig. 2.

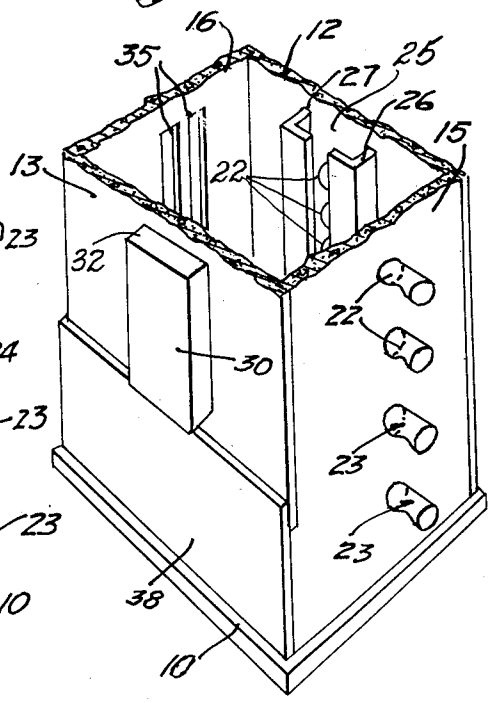
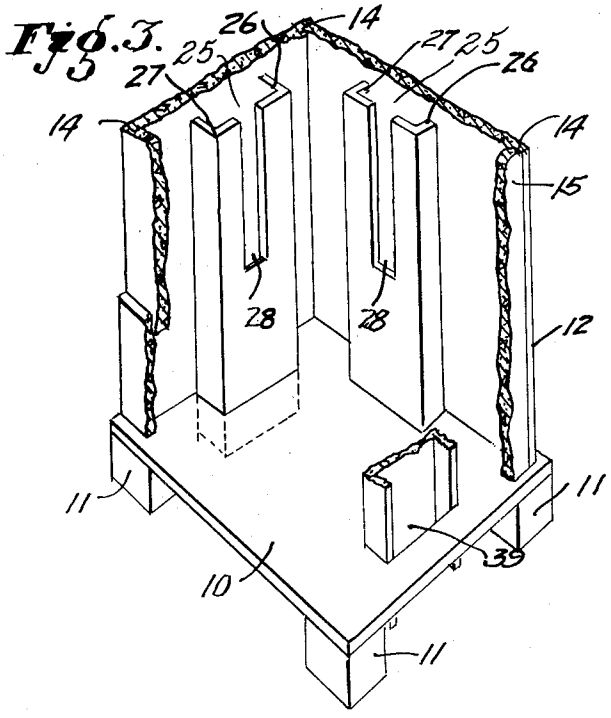


Fig. 3.



INVENTOR.
HARLOW H. HATHAWAY.
BY
James M. Abbett
ATTY.

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INCINERATOR

Harlow H. Hathaway, Los Angeles, Calif.

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4 Claims. (Cl. 110—18)

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This invention relates to improvements in structures designed for disposal of waste material, and particularly pertains to an incinerator.

In the disposal of waste material, such as garbage and the like which often has a high moisture content, it is desirable to provide an incinerator which will act to dry the material and to burn it without possibility that it would pack in the incinerator in a manner to retard combustion and the possibility that ashes would accumulate to choke the incinerator and impair the draft of air through it. It is also desirable when providing an incinerator for domestic use to construct the incinerator in a manner to facilitate the movement of the incinerator to the point of erection, and to build an incinerator which will be compact in design and simple in construction. It is the principal object of the present invention, therefore, to provide an incinerator structure made of simple parts of light weight which may be assembled easily and to produce an incinerator within which a mass of waste material may be simultaneously dried and burned, and will at all times be provided with a sufficient draft of air to support combustion.

The present invention contemplates the provision of an incinerator having a main fire-box in communication with a flue and into the top of which fire-box waste material may be deposited for burning, the incinerator being further fitted with draft ducts through which air may be constantly drawn to the mass of material without obstruction and which will support combustion of the waste material as it burns from the top of the mass to the bottom of the incinerator.

The invention is illustrated by way of example in the accompanying drawings in which:

Figure 1 is a view in central vertical section through an incinerator embodying the present invention.

Fig. 2 is a view in perspective showing the incinerator with its top portion removed so that the structural details may be seen.

Fig. 3 is a view in perspective showing a modified form of the incinerator with parts broken away for the sake of clearance.

In describing the invention it is to be understood that it is preferable to construct the various parts of the incinerator from cementitious material. Referring more particularly to the drawings, 10 indicates a floor slab. This slab is shown in Fig. 1 as resting directly upon the ground while in Fig. 3 it is shown as being disposed upon supports 11 for a purpose to be hereinafter explained. Disposed upon the floor slab

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10 are a plurality of enclosing side walls including a back wall 12 and a front wall 13 spaced therefrom. Both of these walls are disposed vertically, and are designed with seats 14 along their edges to receive end walls 15 and 16. The contiguous edges of these walls are secured together by bolts, mortar or other suitable means of fastening. The back wall extends vertically to an elevation a considerable distance above the front wall and is formed with an offset edge 17 which provides a partial seat for a flue structure 18 which extends upwardly above the incinerator and receives a stack 19. The front wall 13 has an upper edge 20 which is of a lesser height than the rear wall and thus provides a feed or charging opening 21 through which waste material may be fed into the incinerator. The side wall structure further includes opposite end walls 15 and 16 which are shaped to fit between the walls 12 and 13 and extend upwardly and at an inclination to close in the space represented by the difference in height of the upper edges of the walls 12 and 13 and to provide a seat for the sides and forward edge of the flue 18. The back wall 12 is formed with a vertical row of draft ports 22 which receive tubes 23. The openings 22 are here shown as being circular and the tubes are shown as being cylindrical. These tubes extend outwardly and horizontally and are closed at their outer ends. An opening 24 is formed in the lower side of each of these tubes and in the length of the tubes which project beyond the back wall 12. This makes it possible for air to pass upwardly and into the tubes 23, and will prevent sparks from passing outwardly through the tubes and into the air. The tubes 23 are mounted within the openings 22 so that they will move horizontally through the openings and in this manner it will be possible to vary the effective area of the air inlet openings 24 so that the draft may be controlled by adjusting these tubes horizontally and individually. The inner ends of the tubes communicate with a vertical air channel 25. This channel, as shown in Fig. 2 of the drawing, is defined by members 26 and 27 of angular section which are cast integral with the back wall 12 and extend inwardly therefrom. The angle sections are spaced from each other to provide a vertical and longitudinally extending draft opening 28 for a purpose to be hereinafter described. It will be seen by reference to Fig. 1 of the drawing that the opposite ends of the air channel 25 are open, the lower end occurring a distance above the floor slab 10 and the upper end occurring a considerable distance be-

low the mouth of the flue 18. By this arrangement a free circulation of air from the tubes 23 may pass into the air channel 25 and may flow upwardly into the flue as well as outwardly through the passageway 28 into and through the mass of waste material which is being burned.

The front 13 of the incinerator is here shown as being formed with a longitudinal draft slot 29 through it at a height considerably above the floor slab 10. This longitudinal slot is covered by a channel member 30 which is spaced from the outer face of the wall 13 and forms an induction passageway 31 from the lower end of the channel up to the slotted opening 29 and into the combustion chamber of the incinerator. It is preferable that the upper end of the channel member 30 shall be closed by a member 32. The feed opening 21 to the incinerator is normally closed by a door 33 which is mounted on a hinge 34 at its upper edge and can swing to an open or closed position.

In order that adequate air for combustion may be supplied to the mass of material in the incinerator, it is desirable to provide means for the entry of air at the opposite ends of the incinerator as well as through the front and back walls. For accomplishing this the end wall 15 is fitted with a series of openings 22 of the character previously described as occurring in the wall 12. These openings are fitted with the tubes 23 by which draft adjustment may be made. On the inside of the wall 15 are angle members 26 and 27 forming an air channel 25 which communicates with the interior of the furnace through a vertical passageway 28. The opposite end wall 16 is here shown as formed with a pair of longitudinally slotted openings 35. These are covered on their outsides with a channel-shaped shield 36 which has a portion spaced from and parallel to the outer face of the wall 16. The lower end of the channel is open and the upper end is closed, thus allowing air to be directed into the mass of the material within the incinerator and to flow upwardly.

Attention is directed to the fact that the front wall section 13 does not extend the full height of the incinerator but that it terminates a considerable distance short of the floor slab 10, thus providing a clean-out opening 37. This opening is normally covered by a door slab 38.

Referring particularly to the form of the drawing shown in Fig. 3 it will be seen that the vertical slots occurring between the angle-shaped members 26 and 27 do not extend all the way to the floor slab 10. This prevents the possibility of an accumulation of trash in the lower ends of the air channels 25. It will also be seen that the lower ends of the channel sections in Fig. 3 extend through rectangular openings 39 in the floor slab, thus making it possible for air to pass upwardly from beneath the floor slab and into the structure. This eliminates the necessity for the openings through the side walls of the incinerator. In order for air to gain access to the lower ends of the air channels 25 the floor slab 10 is elevated and mounted upon supporting blocks 11. The structure of the incinerator is otherwise the same as previously described.

In the use of the present invention the various side wall elements and the floor slab are pre-cast as shown, and are then assembled to form a central combustion chamber within which waste material is placed through the opening 21. This material is generally indicated at W. The waste material is piled on the floor slab 10 and is allowed to accumulate to a suitable height which is obtained preferably when the combustion chamber defined by the walls 12, 13, 15 and 16 is approximately half filled. At this time it will be obvious that the material may be confined by the wall sections 12, 13, 15 and 16, and that the openings through the wall will be in proximity to the mass of material. The material is then ignited in the top of the mass and draft will be created through the tubes 23, into the channels 25, and through the openings 28 as well as the openings 29 in the front wall 13 and openings 23 and 35 in the opposite side walls. Adequate air to support combustion will thus be provided so that the mass of material will burn from the top and gradually burn down to the floor slab 10. In the form of the invention shown in Fig. 3 of the drawing it will be evident that air will pass in through the openings 39 in the floor and upwardly in the air channels 25. When the material has been burned the front slab member 38 may be removed so that the ashes and unburned waste may be scraped out of the combustion chamber and the structure will be placed in condition for further operation.

It is to be understood that while the incinerator is shown as being rectangular in cross-section that it may be of any other desired shape, and that while it is shown as being constructed of cementitious material it may be made from any other suitable non-combustible material.

It will be seen that the incinerator here disclosed is composite in structure and light in weight, thus making it possible for the elements to be transported easily to the point where the incinerator is to be erected, and when the incinerator is assembled it will operate effectively to burn large masses of waste material without choking. It will also be evident that while this material may contain considerable moisture it will be possible for the mass to be gradually dried and burned since the burning operation takes place at the top of the mass and the material underneath it will be progressively dried as combustion proceeds.

While I have shown the preferred form of my invention as now known to me, it will be understood that various changes may be made in combination, construction and arrangement of parts by those skilled in the art, without departing from the spirit of the invention as claimed.

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

1. In a refuse burning incinerator comprising a base slab, enclosing side walls connected thereto by substantially airtight joints, and an upper closure member connected to the side walls to enclose a combustion chamber having a flue outlet and a charging door opening through an upper portion thereof, with a door covering said latter opening; a pair of oppositely positioned angle members mounted vertically and in laterally spaced apart relation to each other on the inner side of a combustion chamber wall, the angle members terminating at bottom and top respectively short of the bottom slab and the upper closure member thereby to support refuse in the combustion chamber in inwardly spaced relation to the wall, the wall having a draft opening therethrough in communication with the space between the said angle members, and draft control means mounted to control air flow through said draft opening thereby to introduce controlled amounts of draft air into and over refuse matter in the combustion chamber for drying refuse matter and supporting

combustion from the top and sides only thereof.

2. The incinerator of claim 1 wherein the draft control means comprises a hollow tubular member of corresponding cross-section to the draft opening and slidably inserted therein, the tubular member being closed at its outer end and having a draft opening in its lower side, the tubular member being insertible in its opening to a distance to cover the opening in the tubular member.

3. In a refuse burning incinerator comprising a base slab, enclosing side walls connected thereto by substantially airtight joints, and an upper closure member connected to the side walls to enclose a combustion chamber having a flue outlet and a charging door opening through an upper portion thereof with a door covering said latter opening; a pair of oppositely positioned angle members mounted vertically and in laterally spaced apart relation to each other on the inner side of a combustion chamber wall, the angle members terminating at bottom and top respectively short of the bottom slab and the upper closure member thereby to enclose a rectangular space inwardly of the wall and to support refuse in the combustion chamber in inwardly spaced relation to the wall, the wall having a plurality of small vertically spaced draft openings therethrough in communication with the space between the said angle members, and draft control means mounted in each of said draft openings to control air flow through said draft openings thereby to introduce controlled amounts of draft air at selected heights into and over refuse matter in the combustion chamber for drying the refuse matter and controlling combustion thereof.

4. A refuse burning incinerator comprising enclosing side walls connected together by substantially air-tight joints and adapted to rest on a base whereby said walls enclose a combustion chamber, means covering the upper end of said combustion chamber and providing a flue outlet

therefrom and a charging opening through which refuse may be fed into said combustion chamber, there being an air admission slot formed vertically in at least one of said side walls, said slot extending upwardly from a relatively low level in said combustion chamber to a level near the top thereof, and an external channel member united with the wall having said slot and superposed over said slot and extending upwardly from below the lower end of the latter so as to completely enclose said slot, said channel member being open at its lower end below the bottom of said slot and closed at its uper end so that said channel member delivers air upwardly to said slot and through said slot into said combustion chamber at all points disposed progressively upwardly from the lower end of said slot, said channel member being wider than said slot so as to provide a passageway for air upwardly through said channel member in spite of refuse projecting outwardly through said slot into said channel member.

HARLOW H. HATHAWAY.

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