

March 29, 1932.

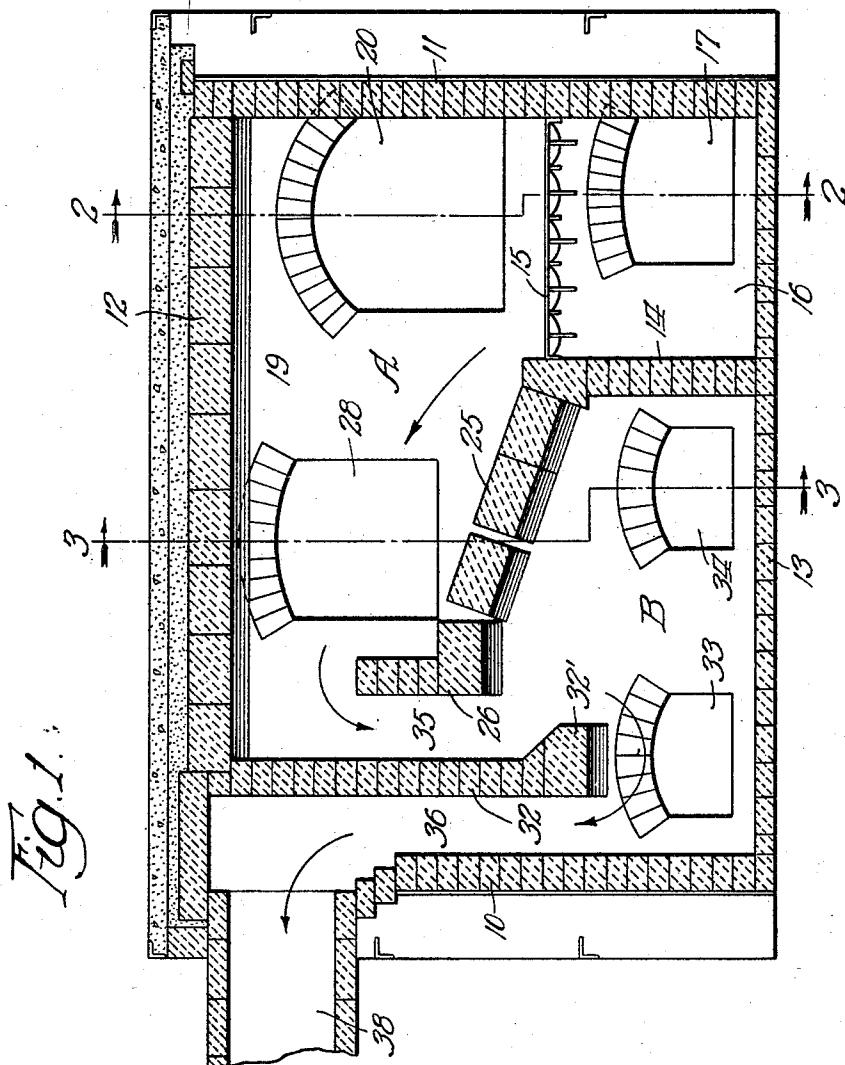
S. H. THOMPSON

1,851,336

INCINERATOR

Filed Dec. 12, 1927

2 Sheets-Sheet 1



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Fig. 3.

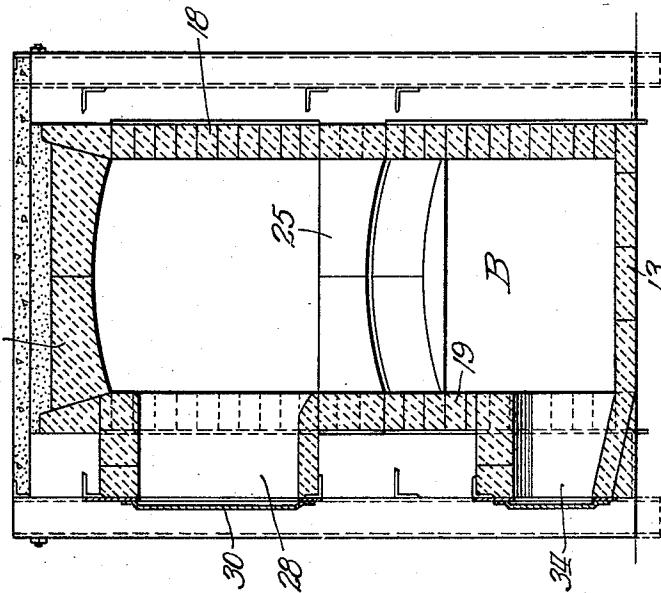
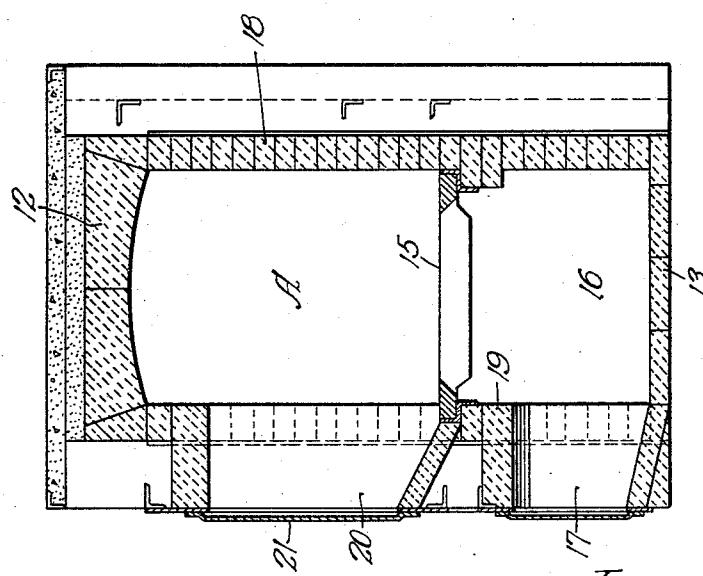


Fig. 2.



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UNITED STATES PATENT OFFICE

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INCINERATOR

Application filed December 12, 1927. Serial No. 239,273.

This invention relates to improvements in incinerators and has among its objects to provide a new and improved apparatus comprising a grate for relatively dry refuse and a hearth for moist refuse such as garbage or the like, a primary combustion chamber overlying the grate and hearth and a second combustion and settling chamber directly underlying the hearth, all arranged with restricted flues leading to and from the second combustion chamber whereby a compact, efficient incinerator or refuse destructor is obtained with ample gas travel and settling space, and one which will conveniently and readily handle wet and dry refuse in fair relative proportions.

This application is in part a substitution for my application Serial No. 137,873.

These and other objects will be more fully set forth and described in the following specification and illustrated in the accompanying drawings, in which—

Fig. 1 is a vertical longitudinal section through an incinerator embodying my invention;

Fig. 2 is a transverse vertical section along the line 2—2 of Fig. 1; and

Fig. 3 is a similar section along the line 3—3 of Fig. 1.

The furnace incinerator is formed with front and rear walls 10, 11, respectively, and side walls 18, 19, all formed of suitable refractory material. A roof 12 is provided, as is a suitable bottom or base 13. Projecting upwardly from the bottom 13 is a partition wall 14 between which and the end wall 11 extends a grate 15 overlying the ash pit 16. Access may be had to the latter through an opening 17 for inspection or removal of ashes, cinders or the like.

In the side wall 19 in addition to the clean-out opening 17 is a charging opening 20 located above and adjacent the grate 15, a suitable door or other closure 21 being provided. Extending upwardly and forwardly from the partition wall 14 is a hearth 25 preferably of arched construction and formed of refractory blocks, this hearth leading to a vertical guard wall 26 also formed of refractory, and terminating some distance below the roof 12. A

charging opening 28 is provided in the side wall 19 above the hearth 25. It will be apparent that the charging openings 20, 28, may be located wherever convenient for deposit of refuse upon the grate and hearth. A suitable closure 30 is provided for the opening 28, as shown in Fig. 3, for example.

Extending downwardly from the roof 12, and terminating short of the bottom 13, but below the upper end of the hearth 25, is a baffle wall 32 resting upon the support 32' which in the embodiment illustrated is an arch and extends between the side walls 18 and 19 of the incinerator. The support 32' is of greater width than the baffle wall 32, so that it projects elbow-like into the secondary combustion chamber B for a purpose hereinafter described.

Clean-out openings 33, 34, are also provided in the side wall 19 and are provided with suitable closures to permit ready access to the interior of the incinerator beneath the hearth 25 and baffle wall 32.

In the embodiment shown, the baffle wall 32 is spaced sufficiently from the guard wall 26 to provide a flue 35 extending substantially across the furnace of restricted area, as contrasted with the combustion chambers, and this baffle wall 32 is similarly located with respect to the front end wall 10 to provide a second restricted flue 36 which also extends substantially across the furnace and which leads to the outlet chamber duct 38.

It will be apparent that in the structure described above, the grate 15, hearth 25, guard wall 26, partition wall 14, end wall 10 and bottom 13 form what I term a secondary combustion chamber, which, it will be noted, is located in large part directly beneath the hearth 25. This secondary combustion chamber is likewise of ample size, particularly as contrasted with the cross-sectional area of the flues 35, 36.

In the operation of my improved incinerator, the lighter and more combustible refuse is charged upon the grate 15, and the moist and reluctantly combustible material, such as wet garbage, is charged upon the hearth 25, the guard wall 26 increasing the

capacity of such hearth and preventing tumbling of refuse down through the duct 35.

Upon combustion of the material on grate 15, the gases of such combustion expand in primary combustion chamber A and flow over the refuse on the hearth 25, the inclination of which assists in the subjection of such refuse to the action of the gases from the combustion of the material on grate 15.

10 The gases, together with any generated from the moist refuse on the hearth 25 flow through flue 35 at some velocity into the secondary combustion chamber B wherein expansion of such gases is permitted, thus 15 checking the velocity thereof, and permitting completion of combustion and the settling of any solids suspended by the gas prior to discharge through the stack. This action also obviates the pick-up of solids by 20 the outflowing gases. The gases and any combustion occurring in the chamber B directly heat the overlying hearth 25 and increase the destructive effect on the refuse charged thereon. Flue 36 being again relatively restricted permits exit upwardly at substantial velocity, under the chimney draft, of the completely burned gases from 25 the secondary chamber B.

It will thus be noted that the combustion 30 takes place and the gases therefrom flow both above and below the wet or relatively non-combustible material on hearth 25 and greatly expedite its destruction and incineration, and the ample secondary chamber B 35 permits the effectuation of complete combustion and destruction of noxious gases and odors which might otherwise be discharged into the atmosphere.

The construction is greatly compacted over 40 that heretofore employed and efficiently handles a large proportion of wet garbage or refuse in varying proportion and with substantially complete settling and retention of solids. Where an excessive percentage of the 45 latter is being charged into the incinerator it is possible to utilize fuel upon grate 15 to counteract the reluctance to combustion of such excessive charge of wet refuse or garbage.

50 The support 32' projecting partially into the chamber B forms an elbow as shown in Fig. 1, and serves to direct the flowing gases of combustion toward the interior of such chamber directly beneath the hearth 25 and 55 above the bottom of chamber B so that any tendency to pick up solids is further discouraged. The downward flow to the chamber A and the upward flow therefrom contribute to the efficacy of the settling in chamber B. Where the passages 35, 36, are extended across the width of the furnace, as illustrated, the full width of the chambers A and B is utilized with consequent efficiency.

60 It will be obvious that the apparatus illus-

trated and described may be modified and varied without departure from the spirit of my invention, and I do not wish to be restricted to such embodiment as shown and described except as defined in the appended 70 claims.

What I claim is:

1. In combination, an incinerator having end, side and roof walls, a grate located therein, an inclined hearth also located therein leading upward from one end of said grate, said hearth being provided with associated walls to form a primary combustion chamber overlying said hearth and grate and with a secondary combustion and settling chamber directly underlying and in contact with said hearth, the latter forming a roof therefor, and a vertical baffle wall spaced from one end of said hearth and extending between said side walls and coacting with the hearth end to provide a vertically extending duct of relatively short length and restricted area leading downwardly to said secondary chamber, said baffle wall also being spaced from one of the walls of said incinerator to provide on its opposite side an upwardly directed, relatively restricted outlet duct from said secondary chamber, a side wall of said incinerator having an opening leading into said secondary chamber to permit removal of the material which has settled therein.

2. In combination, an incinerator having end, side and roof walls, a grate located therein, an inclined hearth leading upward from one end of said grate also located therein, said incinerator being further provided with a primary combustion chamber of substantial volume overlying said hearth and grate, and with a secondary combustion and settling chamber directly underlying and in contact with said hearth, the latter forming a roof therefor, a vertical baffle wall spaced from one end of said hearth and coacting therewith to provide a relatively short duct of substantially restricted cross section as compared with both said chambers leading to said secondary chamber to cause a sudden increase and decrease in the velocity of the gases as they enter and leave said duct thereby to secure mixing of the gases and settling of solid particles in said secondary chamber, said vertical baffle wall terminating above the bottom of said incinerator but below said hearth and provided with a short deflecting elbow projecting into said secondary chamber.

3. In combination, an incinerator having end, side and roof walls, a grate located therein, an inclined hearth leading upward from one end of said grate also located therein, said incinerator being further provided with a primary combustion chamber of substantial volume overlying said hearth and grate and with a secondary combustion and settling chamber of substantial size directly

underlying and in contact with said hearth, the latter forming a roof therefor, a vertical baffle wall spaced from one end of said hearth and coacting therewith to provide a relatively short duct of substantially restricted area as compared with both said chambers leading downwardly to said secondary chamber, said baffle wall also being spaced from one of the walls of said furnace to provide on its opposite side an upwardly directed, relatively restricted outlet flue from said secondary chamber, said secondary chamber being closed against the entrance or escape of gases except through said duct and flue, and a door 10 in one of said side walls leading to said settling chamber to permit the removal of material which has settled therein.

4. In combination, an incinerator having end, side and roof walls, a grate located therein, an inclined hearth leading upward from one end of said grate also located therein, said incinerator being further provided with a primary combustion chamber of substantial volume overlying said hearth and grate and 25 with a secondary combustion and settling chamber directly underlying and in contact with said hearth, the latter forming a roof therefor, and a vertical baffle wall spaced from one end of said hearth and extending 30 below said hearth but terminating short of the bottom of said furnace to provide a relatively short duct leading to said secondary chamber, said wall being provided with a short deflecting elbow projecting into said 35 secondary chamber and arranged to deflect the gases across the upper portion of said secondary chamber so as not to disturb the settled out particles on the bottom of the chamber, said baffle wall also being spaced 40 from one of the walls of said furnace to provide an outlet duct from said secondary chamber.

5. An incinerator comprising in combination a walled enclosure having therein a grate 45 for burning dry combustibles, an upwardly inclined hearth having its lower end adjoining one edge of said grate and leading upward therefrom and adapted to receive moist refuse, said enclosure providing a primary 50 combustion space of substantial volume above said grate and hearth, a secondary combustion chamber directly below and in contact with said hearth having a cross sectional area substantially as large as that of said primary 55 space to permit a slow velocity of gases through said secondary chamber, and a relatively short passage substantially restricted in cross section as compared with said primary and secondary combustion chambers 60 and leading downwardly from an end of said hearth remote from said grate and entering the top of said secondary combustion chamber and arranged to effect a sudden change 65 in velocity of the gases both on leaving said primary combustion chamber and on entering

said secondary combustion chamber, whereby said gases are well mixed and solid particles are permitted to settle out in said secondary combustion chamber, and a vertical flue of restricted cross section compared with that of said secondary chamber leading therefrom for the escape of gases of combustion, said secondary chamber being closed against the entrance or escape of gases except through said passage and said flue, and said enclosure having a door in its wall leading to said secondary combustion chamber to permit the removal of the material which has settled therein. 70

6. In combination, an incinerator having end, side and roof walls, a grate in said incinerator, a hearth inclined upwardly from one end of said grate and provided with a guard wall at its upper end, said incinerator having a primary combustion chamber of substantial volume overlying said hearth and grate, and having a secondary combustion and settling chamber of substantial size directly underlying and in contact with said hearth, the latter forming a roof for said secondary chamber, 90 a relatively short duct restricted in cross section as compared with that of said chambers leading from said primary chamber at a side of said hearth remote from said grate to said secondary chamber whereby the heat and flames from said grate are brought into close contact with said hearth in passing to said duct, and a duct leading from said secondary chamber at the end of said incinerator opposite said grate. 95

In testimony whereof, I have signed my name to this specification.

SAMUEL H. THOMPSON.

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