July 1, 1930. E. O. HOWLE 1,769,880

INCINERATOR

Filed Oct. 27, 1927 2 Sheets-Sheet 1

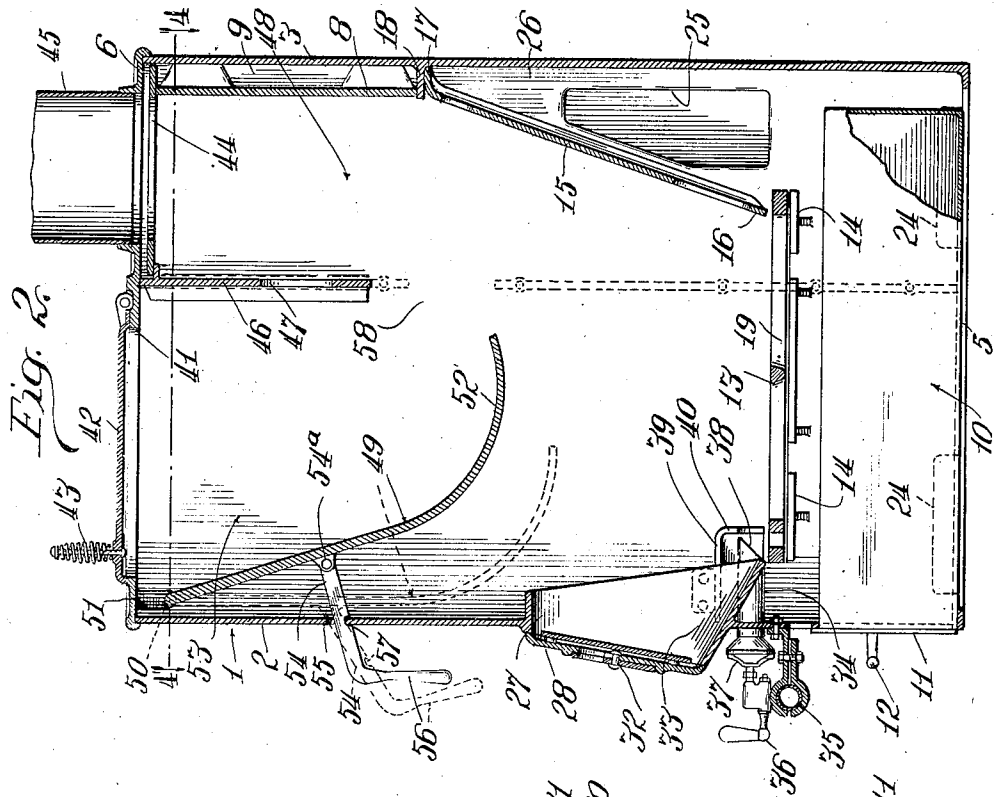


Fig. 2.

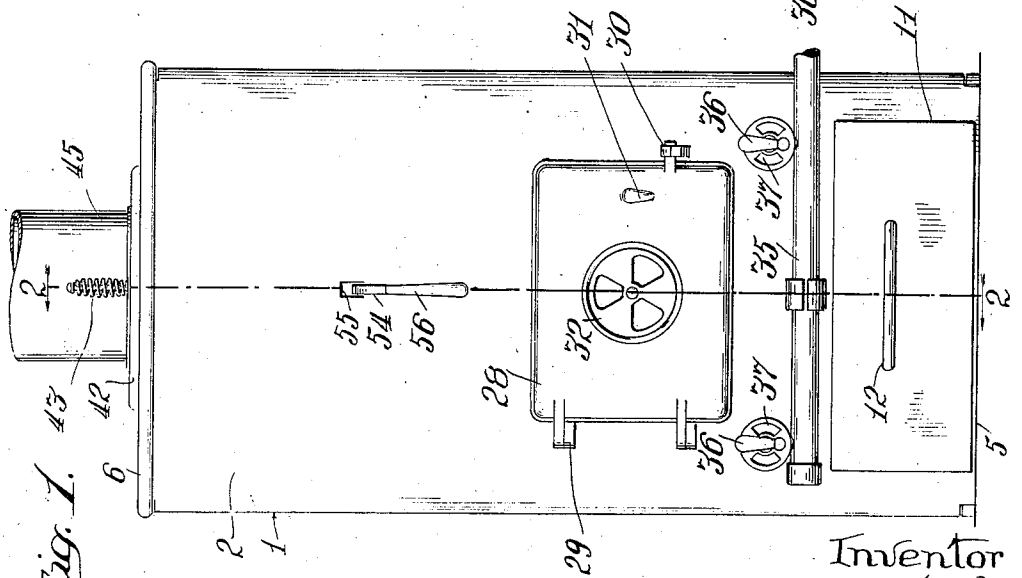


Fig. 1.

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Fig. 3.

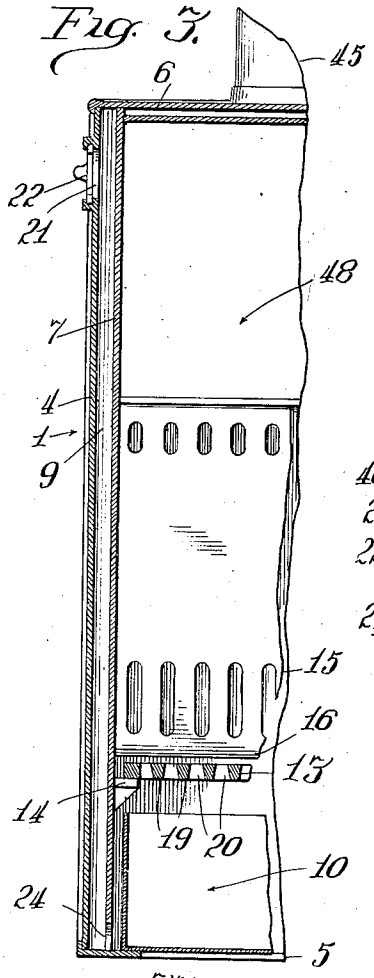


Fig. 4.

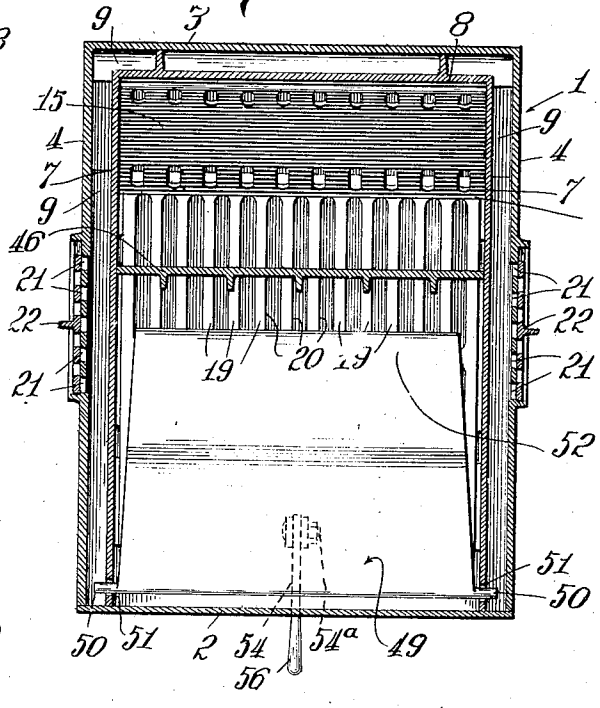
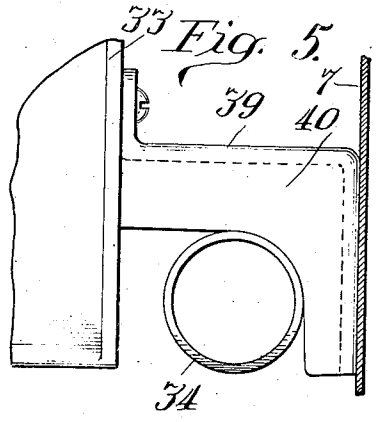


Fig. 5.



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UNITED STATES PATENT OFFICE

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INCINERATOR

Application filed October 27, 1927. Serial No. 229,052.

This invention relates to improvements in an incinerator, particularly adapted for use in the basement of a home or other building for burning garbage and other refuse of all kinds.

One of the principal objects of the invention is to provide an incinerator of this type, adapted to handle wet and dry materials, provision being made for drying out the wet materials before they are introduced into the furnace chamber proper and means are also provided to force malodorous vapors or gases issuing from the drying material to pass through the burning zone, or combustion chamber, before they enter the flue.

More specifically, the invention contemplates the use of a hopper or shelf adapted to temporarily support wet materials such as garbage above the furnace chamber proper, provisions being made to dump these materials into the furnace chamber after they have been dried out.

Another object is to provide an improved combination of grates within the incinerator whereby an increased area of the refuse materials will be exposed to the incoming combustion air.

Another object is to provide, if desired, an incinerator provided with one or more gas jets positioned to project their flames above the grate so as to maintain the combustion without unduly burning the grate.

Another object is to provide the furnace with an air-jacket or hollow walled construction through which all combustion air must pass, in order to preheat the air and reduce the heat lost.

Other objects and advantages of this invention will be apparent from the following detailed description of one approved form of the apparatus.

In the accompanying drawings:

Fig. 1 is a front elevation of the incinerator.

Fig. 2 is a central vertical section taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is a partial transverse vertical section, taken substantially at right angles to Fig. 2.

Fig. 4 is a horizontal section, taken substantially on the line 4—4 of Fig. 2.

Fig. 5 is an enlarged detail vertical section illustrating one of the burner-shields.

The incinerator comprises an outer steel shell 1, consisting of a front wall 2, a back wall 3, side walls 4, a bottom 5 and a top 6. An inner cast iron shell consisting of vertical side walls 7 and a rear wall 8 incloses the furnace and combustion chamber, the walls 7 and 8 being spaced from the walls 4 and 3 of the outer shell to define an air space 9 therebetween for preheating the combustion air. An ash-receiving receptacle 10 rests upon the bottom 5 of the casing, and is slidably introduced through an opening in the front wall of the outer shell 1, the vertical front wall 11 of the receptacle 10 serving to close this opening when the receptacle is in place. A handle 12 is provided on the front of the receptacle for removing same to empty the ashes.

A main horizontal grate 13 is supported in the lower portion of the incinerator above the receptacle 10 by means of brackets 14 extending inwardly from the side walls 7. This grate 13 is shorter than the depth of the incinerator casing from front to rear (as best shown in Fig. 2) so that the grate may be shifted horizontally to sift the ashes and to dump incombustible material such as tin cans into the receiver 10. A rear grate 15 is supported between the side walls 7 in an upwardly and rearwardly inclined position with its lower end 16 positioned above the rear end of horizontal grate 13, and its upper edge 17 positioned beneath the ledge 18 which supports the rear wall 8 of the inner casing, which as shown in Fig. 2 terminates directly above the rear grate 15. In the example shown, both grates are of the well known type consisting of spaced parallel bars 19, with elongated spaces 20 therebetween.

Suitable air inlets 21 are provided in the upper portions of the outer side walls 4, sliding dampers 22 being provided to regulate these air inlets. The pre-heated air passes from the space 9 between the side walls through openings 24 at the bottom of the casing into the ash receiving space and thence up through the grate. Air also passes through the openings 25 in the rear portion of the inner side walls 7 into the space 26

behind the rear grate 15 and thence through this grate into the combustion chamber.

An inlet opening 27 in the front wall 2 of the outer casing, slightly above the grate 13, is normally closed by a door 28 hinged in any suitable manner at 29, and provided with a catch 30 and a handle 31. A damper 32 of usual form may be provided in door 28. A chute 33 formed within the inlet opening 27 projects inwardly and downwardly to direct dry materials inserted through this opening onto the horizontal grate 13.

A pair of gas burners 34, supplied from gas manifold 35 and controlled by gas valves 36 and air inlet valves 37, are mounted in the front wall 2 directly above the grate 13 and one at either side of chute 33. The outlet openings of these burners are beveled or undercut as indicated at 38 so as to minimize the danger of materials which are introduced into the incinerator clogging the gas outlets. To increase this protection, shields 39 (best shown in Fig. 5) are mounted between the chute 33 and side walls 7, and have front portions 40 slightly overhanging the burners 34 so as to shield these burners as far as possible from the materials within the incinerator. It will be noted that these burners project their flames into the material in the furnace chamber directly above the grate 13 so as to obtain the maximum benefit of these flames in maintaining the combustion, while at the same time minimizing the heat to which the grate 13 is subjected. In the usual form, wherein the burners are projected upwardly through the grate from beneath, a great deal of the heat from these burners is wasted in heating the grate.

A second inlet opening 41 is provided in the forward portion of the top plate 6 of the shell 1, this opening being provided with a cover 42 having a handle 43 by which the cover may be conveniently lifted. This opening 41 is used for the introduction of garbage and other wet refuse. A flue or outlet 44 for the gaseous products of combustion is provided in the rear portion of top plate 6, this flue communicating with a chimney 45. A baffle plate 46, provided with spaced openings 47, projects downwardly from the top 6 between the inlet 41 and the outlet 44. This baffle 46 forms a vertical partition extending between the inner side walls 7 and downwardly to approximately the upper level of the back grate 15, thus forming the front wall of a combustion chamber 48 through which the hot gases must pass on their way to the outlet flue 44.

A curved plate or hopper 49 of substantially the width of the space between inner side walls 7 is hinged at its upper edge by means of outwardly projecting trunnions 50 which engage in slots 51 in the inner casing adjacent the upper front corners of the incinerator. The lower portion of this plate 49 is curved inwardly and upwardly as indicated at 52 so that when the plate is in the position indicated in full lines in Fig. 2 it will form a hopper adapted to cooperate with the baffle wall 46 in temporarily supporting in the drying chamber 53 the garbage or other wet refuse inserted through the inlet opening 41. A rod or bar 54ª is hinged at 54′ to an intermediate portion of hopper 49, extends outwardly through a slot or opening 55 in the front wall 2 and terminates in a handle 56. A notch 57 in bar 54 is adapted to be engaged with the front wall 2 whereby bar 54 will act as a support to maintain the hopper 49 in the supporting position indicated in full lines in Fig. 2. By slightly raising the handle 56 and disengaging the notch 57 from wall 2 the hopper may be swung downwardly to the position indicated in dotted lines in Fig. 2 so as to dump the material formerly supported by the hopper into the furnace chamber above the grate 13.

In operation, the hopper 49 will normally be maintained in the full line position indicated in the drawings. Dry refuse will be introduced into the incinerator through the front inlet opening 27, and garbage or other wet refuse will be introduced through the upper opening 41. When sufficient refuse has been accumulated, the burning will be started by lighting the gas burners 34. No great amount of heat is required from the burners which are merely necessary to initiate and maintain the combustion. The heat produced by the burning materials upon the grates 13 and 15 will heat the incoming combustion air which must pass between the inner and outer casings, thus utilizing to preheat the combustion air heat that would otherwise be lost through radiation. The combustible materials will not only be supported upon the bottom grate 13 but will also be piled against the rear upwardly inclined grate 15 so that the area of this material exposed to the incoming combustion air will be considerably increased and the combustion facilitated. The hot gaseous products of combustion will pass upwardly through the combustion chamber 48 and outwardly through the flue 44 to chimney 45. During this passage they will impinge against the lower surface of hopper 49 and heat the wet materials in storage chamber 53. The malodorous vapors and gases driven off from the drying materials will pass out from the storage chamber 53, through opening 58 between hopper 49 and baffle wall 46, and through openings 47 in the baffle wall into the combustion chamber 48 where they meet the hot combustion gases rising from the furnace and are broken down or consumed so that only unobjectionable gases pass out through the flue 44. When the material supported by the hopper 49 has been sufficiently dried, the handle 56

may be lifted and pulled forwardly so as to dump the dried material into the furnace chamber wherein it will be consumed along with the other dry materials which have been inserted through the front inlet opening 27. Ashes and other incombustible materials will fall through the grate 13 into the ash receptacle 10, and the lower grate 13 may be pushed back along the supporting brackets 14 so that incombustible materials too large to pass through the grate may be scraped or dumped into receptacle 10. The ashes will be disposed of in the usual manner by withdrawing receptacle 10 from the incinerator.

I claim:

An incinerator comprising a casing, the upper portion of the casing having a double-walled construction, with air intakes communicating with the space between the walls, there being an ash-receiving space in the lower portion of the casing, a horizontal grate positioned above the ash space, a back grate projecting upwardly from the horizontal grate to the rear wall of the casing, an inlet opening in the front wall of the casing, a door for the opening, a chute projecting inwardly from the opening for delivering materials onto the grate, a gas burner mounted in one wall of the casing and projecting above the horizontal grate, a flue outlet in the upper rear portion of the casing, an inlet for wet materials in the upper front portion of the casing, a perforated baffle plate projecting downwardly between this latter inlet opening and the flue outlet, a hopper plate pivotally mounted in the upper front portion of the casing, and means for swinging this plate into position and supporting same beneath the upper inlet opening so as to support wet materials above the furnace chamber.

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