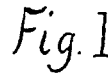


958,308.

4 SHEETS-SHEET 1.



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E. F. PRICE & T. F. BENNETT.
INCINERATING PLANT.
APPLICATION FILED AUG. 14, 1908.

958,308.

Patented May 17, 1910.

4 SHEETS—SHEET 2

Fig. 2

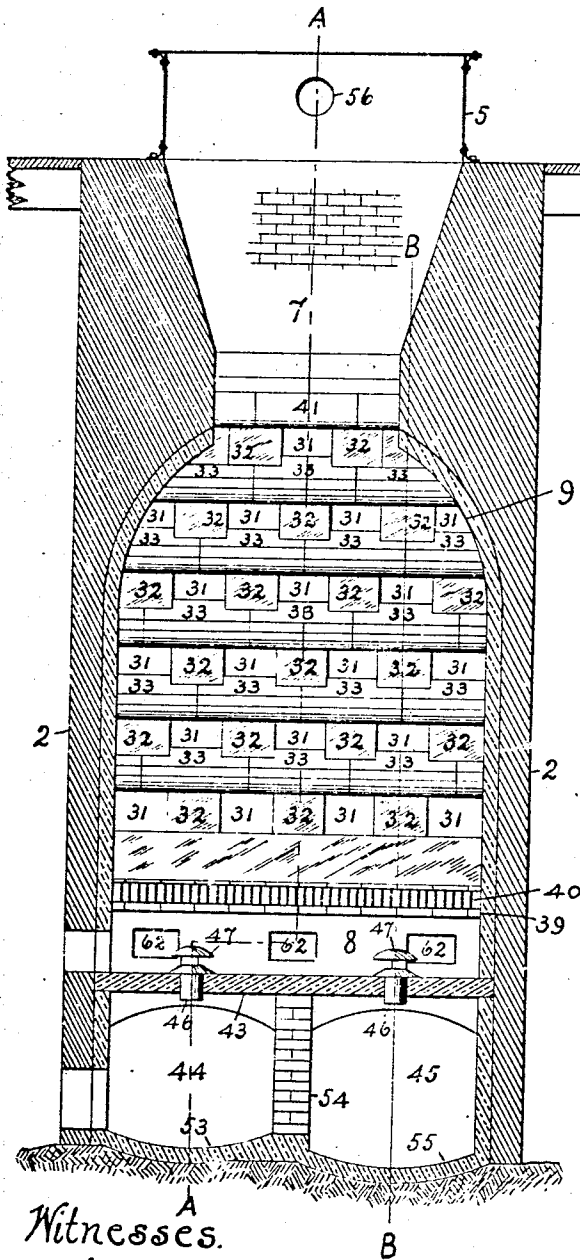
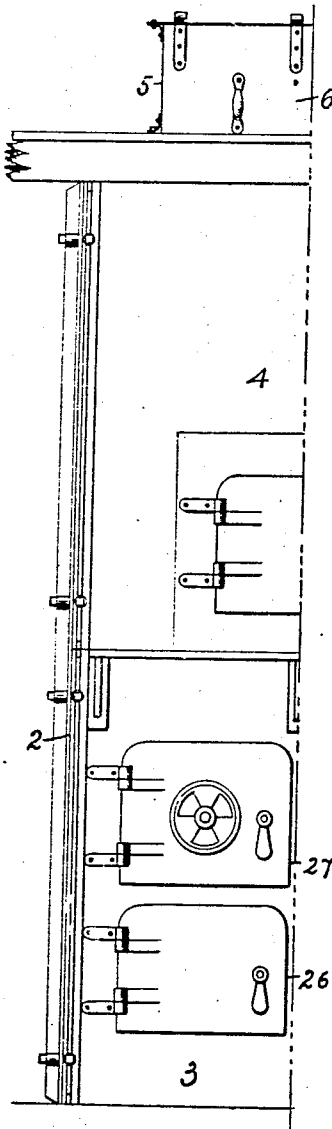


Fig. 3



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958,308.

4 SHEETS-8HEET 3.

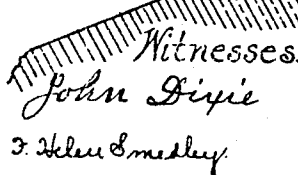


Fig. 6
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4 SHEETS—SHEET 4.

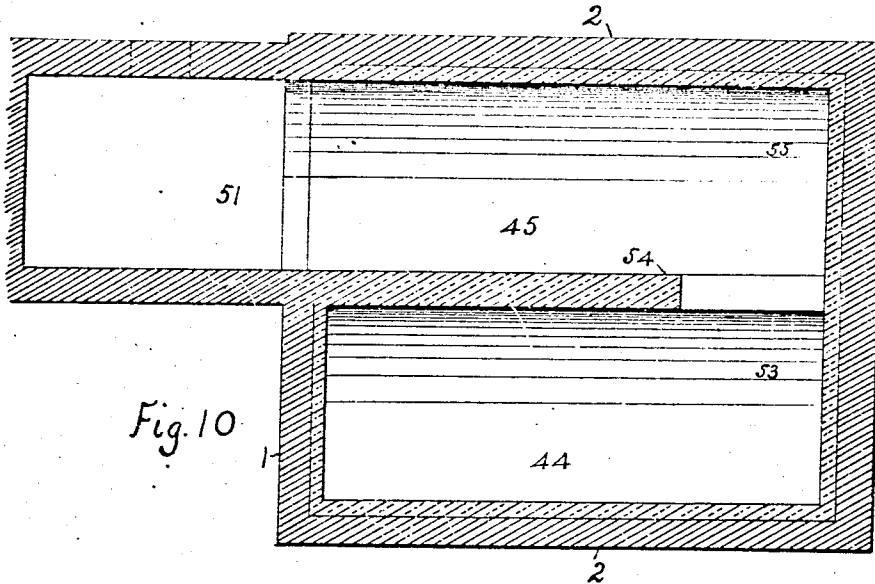


Fig. 10

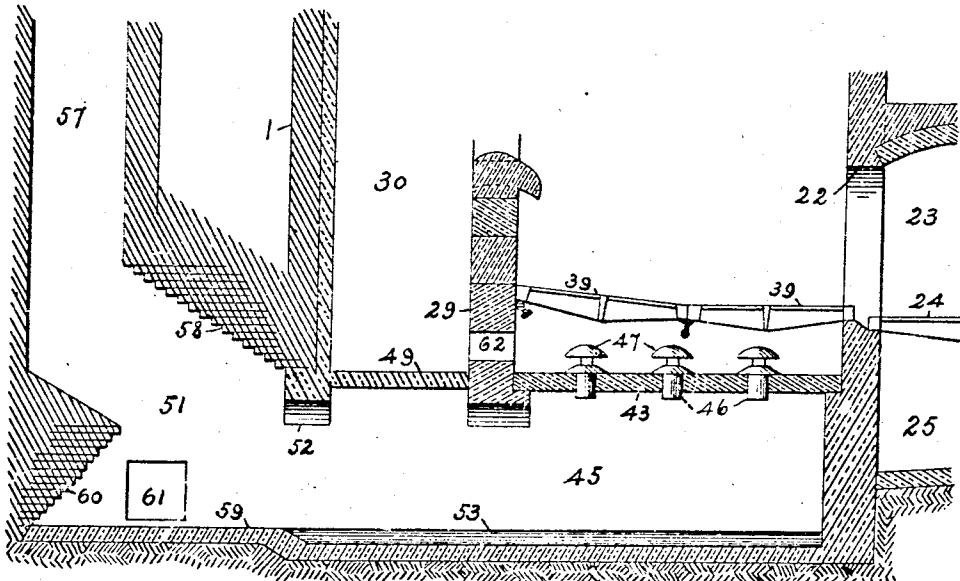


Fig. 11

Witnesses.
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UNITED STATES PATENT OFFICE.

EDWARD F. PRICE, OF LANCASTER, AND THOMAS F. BENNETT, OF PHILADELPHIA,
PENNSYLVANIA, ASSIGNORS OF ONE-THIRD TO JOHN F. KELLER, OF LANCASTER,
PENNSYLVANIA.

INCINERATING PLANT.

958,308.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed August 14, 1908. Serial No. 448,473.

To all whom it may concern:

Be it known that we, EDWARD F. PRICE, of Lancaster, county of Lancaster, and THOMAS F. BENNETT, of Philadelphia, county of Philadelphia, State of Pennsylvania, citizens of the United States, have invented certain new and useful Improvements in Incinerating Plants, of which the following is a specification.

The object of this invention is the construction of a garbage and refuse furnace in which all of the material received is entirely consumed; in which all liquid received is evaporated, and to which there is no need of a sewer connection; in which the noxious gases are thoroughly consumed; and which being of simple construction can be installed in communities where an expensive plant would be prohibitive; and owing to its simplicity is of great durability, and when necessary to be repaired will not entail great expense.

The material to be consumed is first subjected to a drying process, and the extraction of the major portion of its liquids, then dropped to the main furnace where it is exposed for consuming, and the further extraction of all liquids and their precipitation to means provided for their complete evaporation. During the initial drying process the released gases and vapors are conveyed to a heated flue and there consumed. Any heavy sparks or ashes which it would be dangerous to have pass out of the stack are deposited in a receptacle formed in the flue, and can be removed through a cleaning hole. The means employed for the accomplishment of the object sought will be definitely pointed out, and illustrated in the accompanying drawings wherein like parts bear similar reference characters wherever shown, in which—

Figure 1 is a longitudinal vertical section through the structure on line A A Fig. 2. Fig. 2 is a transverse vertical section on line *x x* Fig. 1. Fig. 3 is a one-half front view. Fig. 4 is an enlarged sectional view showing the corrugated removable separator between the drying chamber and the main furnace. Fig. 5 is a section on line *v v* Fig. 4. Fig. 6 is an enlarged sectional view of a portion of the bridge wall. Fig. 7 is an elevation view of Fig. 6. Fig. 8 is an enlarged sectional view of the hooded overflow pipes. Fig. 9 is an inverted plan of the hood for the over-

flow pipes. Fig. 10 is a section on line A A Fig. 1 omitting ash pit 25. Fig. 11 is a section on line B B Fig. 2.

The structure is inclosed in a back wall 1, side walls 2, one of which may be a party wall when a battery of furnaces are constructed, a front wall 3 for the initial fire box, and an upper front wall 4. The structure includes a chamber as a receptacle for the material to be consumed, and in which it is subjected to a drying and draining process, comprising a metallic top part 5, with doors 6 through which to dump the material into the hopper 7, formed of brick at the top of the main furnace 8 and supported by an arch 9. The drying and draining chamber formed by parts 5, and 7 is segregated from furnace 8 by an inclined removable separator 10, which is preferably a heavy metallic plate with corrugations 11, carried on rollers 12 which run on tracks 13 let in flush into the sides of the brick work. The separator 10 is upwardly inclined toward the outer side of the furnace, and its control for insertion and withdrawal is by attached racks 14, operated by pinions 15 on shaft 16 supported in brackets 17. Upon shaft 16 there is a grooved pulley 18 carrying an endless rope or chain 19 whereby the rack and pinion are operated. Wheels 20 bear upon the top of the racks to keep the gear teeth in contact. The separator 10 is stopped, when in operative position so as to leave a space between its inner end 21 and the adjacent wall, for the flow of liquid. The separator 10 being of metal becomes intensely heated, and the corrugations 11 not only greatly increase the heating surface, and stiffen the plate, but form gutters to convey the liquid to space 21 and project it on to bricks 42, and projections 34 of bricks 33, thereby greatly assisting in the drying out process.

Adjacent the main furnace 8, and in communication therewith through arch 22, is the arched top initial furnace 23 and upon its grates 24 the initial coal fire is built, an ash pit 25 is under the grates, and suitable doors 26, and 27 are provided for the pit and fire box. At 28 an opening is provided through wall 4 for facilitating the inspection of the process of incineration, and through which the material may be loosened up for the better attack of the flames from the initial furnace 23. A suitable door will cover the opening 28 and give access there-

to. The main furnace 8 is provided with a bridge wall 29 forming a downtake flue 30 between walls 1 and 29. The construction of this bridge wall is illustrated on an enlarged scale in Figs. 6, and 7 where 31 are the apertures formed in diagonal rows by rectangular bricks 32 forming the sides, and their top and bottom sides formed by the overlapping deflector bricks 33. Bricks 33 extend into main furnace 8 beyond bricks 32 with their inner ends 34 downwardly curved with a curve between bricks 32 in apertures 31, top part 35 and the under part 36 being upwardly curved, and extending between the adjacent bricks 32, thus, with curves 35 and 36 forming apertures 31 in manner to direct the flames from the pile of refuse lying upon the bars 39 with interstices 40 at the bottom of main furnace 8, downwardly into downtake flue 30.

Owing to the multiplicity of diagonally disposed apertures 31, both across and vertically through bridge wall 29 it matters not how high the refuse is piled against the bridge wall 29, as there is sure to be a draft, downwardly tending, into the downtake flue 30. At the upper part of the bridge wall 29 there is a brick 41 which extends into main furnace 8 for a less distance than bricks 33, and it has an inwardly sloping top 42, which receives the liquid passing through space 21 and projects it in toward the center of main furnace 8 and through interstices 40 of bars 39 to the evaporating table 43 which extends across under the whole bottom part of main furnace 8, and forms the top of the bottom flues 44, 45. The evaporating table 43 is provided with multiple overflow pipes 46 which extend somewhat above the table and are covered with hoods 47 to prevent the passage of any solids, the hoods being removable for cleaning purposes. The overflow pipes are supported by flanges 48, shaped to afford slight obstruction to cleaning table 43 by scrapers. Flue 30 has a cover 49, and a side wall 50 over the flue 45 leading to the stack or chimney and an arch 52 through its wall into flue 44. Flue 44 has a concave bottom 53 extending beyond division wall 54 which supports table 43 and forms the return flue 45 leading to the stack flue 51, and the flue 45 also has a concave bottom 55. A pipe 56 leads from the upper part of part 5 to flue 30 for the conveyance of the fumes and gases released in the drying process.

As seen in Fig. 11, flue 51 from its connection to flue 45 is inclined toward the stack 57 at its top part 58, and its bottom 59 is level, and therefrom rises a corbelled back 60, forming a receptacle for the deposit of any heavy or dangerous articles coming from the furnace, and a cleaning hole 61 facilitates their removal. The necessary cleaning holes are provided as are

also the necessary furnace, ash pit and other doors, together with the usual binders, stay rods and the other supports usual in such structures, which are well known and need not be described. Between grates 39 and table 43, through bridge wall 29 there are openings 62, to form a down draft through interstices 40 to table 43 when the refuse is nearly burned out, for the purpose of consuming any greasy mass which may lodge on the table.

In the operation of incineration there is first a white heat produced in the initial furnace 23, which has an arched top to deflect the flames downwardly into furnace 8, and separator 10, then doors 6 are opened and the refuse is dumped into hopper 7 and onto separator 10, when the released liquids flow down in the gutters of the separator, through space 21, on to sloping top 42 and drip on bricks at 35 and are precipitated through interstices 40 to table 43, and the noxious gases and vapors removed through pipe 56 to flue 30. The refuse in hopper 7 having now been dried, sufficiently, and relieved of its liquids, the separator 10 is run back and the mass dumped into main furnace 8 upon bars 39, the mass naturally covering the bars and diminishing in quantity as it reaches upward against bridge wall 29. The flames from the initial furnace attack the mass, and, owing to the multitudinous apertures 31 the whole mass is reduced to a dry state which renders it fit to be drawn into initial furnace 23 by rakes introduced through door 28, where it is utilized as fuel, by the addition of a small amount of coal, to consume the following mass to be consumed; this completely destroys everything received, and at a much decreased expense than if coal had to be used exclusively. Apertures 31 owing to the projections 34 covering their entrance, and their curved tops 35 and bottoms 36 direct the hot flames and air downward and toward the inner side of wall 1 which becomes very hot and readily consumes all that passes through pipe 56, and downwardly therefrom to arch 52, through flues 44, and 45 on its way to the stack and thoroughly heats the underside of table 43, meantime the burning mass in main furnace 8 heats the top of table 43, so that any liquids passing through interstices 40 on to the table are evaporated.

To still further guard against non-evaporation of an excess of liquids passing to table 43 an overflow is provided through pipes 46 to concave floor 53, from which if full to overflowing the excess will pass to the lower concave floor 55 of flue 45, and in these concave floors the liquid is again exposed to the heated air and gases on their way to the stack. By means of openings 62, any fatty

or adhering substances lodging on table 43 are consumed, by the flames from the interspaced bottom 40 deflected to the table by the draft through openings 62 to the downtake 50. The utilization of refuse with a small proportion of coal, in the initial or primary furnace results in great economy. The complete evaporation of all liquids saves the construction of connecting sewers, and the burning of the noxious gases and fatty substances renders this plant void of objections in any locality.

We claim—

1. In an incinerating plant, walls forming in combination, a main furnace, an initial furnace in communication therewith, and a drying chamber as a receptacle for the material to be consumed, said chamber being adapted to dry the material previous to its incineration; a removable separator between the drying chamber and the main furnace, provided with gutters for liquid flowing and inclined to facilitate the flow, and provided with an open space at its lower end, to permit the flow to the main furnace; projecting bricks from the main furnace's back wall adapted to catch and evaporate the liquid flow, and means for moving the separator to discharge the material into the main furnace.

2. In an incinerating plant, walls forming in combination, and in communication an initial furnace, and a main furnace, a drying chamber above the main furnace, and an inclined removable separator to segregate the main furnace and the drying chamber, the separator being formed in corrugated gutters to permit the release and flow of the liquids from the solids deposited thereon, and provided with an open space at its lower end, and projecting heated bricks forming part of the main furnace back wall adapted to intercept and evaporate the released liquid.

3. In an incinerating plant, walls forming in combination, an initial furnace, a drying chamber, and a main furnace located between the initial furnace and the drying chamber the initial and main furnaces being in communication; an inclined and guttered separator between the main furnace and the drying chamber, with an open space for liquid flowing at its inner end, through which the liberated liquid is precipitated; the back wall for the main furnace comprising in part inwardly projecting bricks located directly under the space for liquid flowing, and means for the removal of the separator to permit the discharge of the solids into the main furnace.

4. An incinerating plant comprising walls forming a main furnace, an initial furnace in communication therewith, a drying chamber and a downtake flue having an outlet to a stack; removable means to separate the

main furnace and the drying chamber; multiple means to connect the main furnace and the downtake flue, with projections over said means and extending into the main furnace.

5. An incinerating plant having walls forming a main furnace and an initial furnace in communication, a drying chamber and a downtake flue and connections therefrom to a stack; the main furnace and downtake flue separated by an apertured bridge wall; deflectors over the apertures, which extend into the main furnace; and means to separate the main furnace and the drying chamber, and to connect them.

6. An incinerating plant comprising walls forming a main furnace and a communicating initial furnace, a drying chamber also in communication with the main furnace and a downtake flue having an outlet for the products of combustion; the downtake flue being in communication with the main furnace by an apertured wall common to both; deflectors above the apertures which extend into the main furnace, the tops of the deflectors being convex and their undersides being concave.

7. An incinerating plant having walls forming a main furnace, and a communicating initial furnace, a drying chamber opening into the main furnace and a downtake flue in communication with the main furnace; an evaporating table at the bottom of the main furnace, hooded overflow pipes through the table, in communication with flues under the table which lead to the stack from the downtake flue, and inclined grates above the table and across the main furnace.

8. An incinerating plant comprising walls forming a main furnace, an initial furnace in communication therewith, a drying chamber opening into the main furnace and a downtake flue in communication with the main furnace, and a stack; a grate near the main furnace's bottom, an evaporating table forming the bottom of the main furnace and having thereunder a flue communicating at its back end with the downtake flue; and a second flue in communication at its front end with the flue from the downtake, preferably parallel therewith, and in communication at its opposite end with the chimney or stack, and draining means from the evaporating table top into the flues aforesaid.

9. An incinerating plant comprising walls forming a main furnace, an initial furnace communicating therewith, a drying chamber opening into the main furnace and a downtake flue communicating with the main furnace; an openwork, as a grate near the main furnace bottom; an evaporating table at the main furnace bottom, below the gratework and having thereunder flues in intercommunication at their ends toward the front of the main furnace, one being connected at the back with the downtake and the other with

a stack, overflow pipes from the evaporating table into the flues, and removable hoods for the overflow pipes.

10. In an incinerating plant having walls forming a main furnace, an initial furnace communicating therewith, a drying chamber and a downtake flue communicating with the main furnace, a flue separated from and below the main furnace bottom and in communication at its back end with the downtake flue, and having a concave bottom; a second flue communicating at its front end with the aforesaid flue and parallel thereto and in communication at its opposite or back end with a chimney or stack, and having a concave bottom for the flue, but on a lower level than its intercommunicating flue, and means whereby liquid from the main furnace may pass into said intercommunicating flues.
11. In an incinerating plant, walls forming the combination of a main furnace, and an initial furnace in communication, a downtake flue and a drying chamber, the drying chamber having removable means for its separation from the main furnace, said means being provided with gutters for liquid separation, and a space for such flow to the main furnace; the wall between the main furnace and the downtake having apertures therein and provided with bricks which project into the main furnace, over each aperture, and directly below the flow space aforesaid, to intercept and scatter the liquid flow.
12. In an incinerating plant, walls form-

ing a main furnace, and a communicating initial furnace, a drying chamber above the main furnace and in communication therewith, and a downtake flue also in communication with the main furnace; a stack, passages from the downtake to the stack base, a corbellated recess at the base of the stack for arresting heavy and dangerous objects passing to the stack, and means for the removal of said objects.

13. In an incinerating plant, walls forming a main furnace, and a communicating initial furnace, a drying chamber above and communicating with the main furnace, and a downtake flue communicating with the main furnace and having an outlet for the products of combustion; an evaporating table forming the bottom of the main furnace, a grating above the table, in the furnace, and means of communication from the main furnace above the grating, to the downtake; means of communication from the main furnace to the downtake between the grating and the evaporating table, and whereby flames may be deflected from the grate to the table, and thence to the downtake.

In testimony whereof we affix our signatures, in presence of two witnesses.

EDWARD F. PRICE.
THOMAS F. BENNETT.

Witnesses:

RANSOM C. WRIGHT,
WILLIAM C. STOEVER.