E. R. THORPE & S. C. THOMPSON.

GARBAGE INCINERATOR.

APPLICATION FILED DEC. 18, 1912.

1,070,209.

Patented Aug. 12, 1913.

2 SHEETS—SHEET 1.

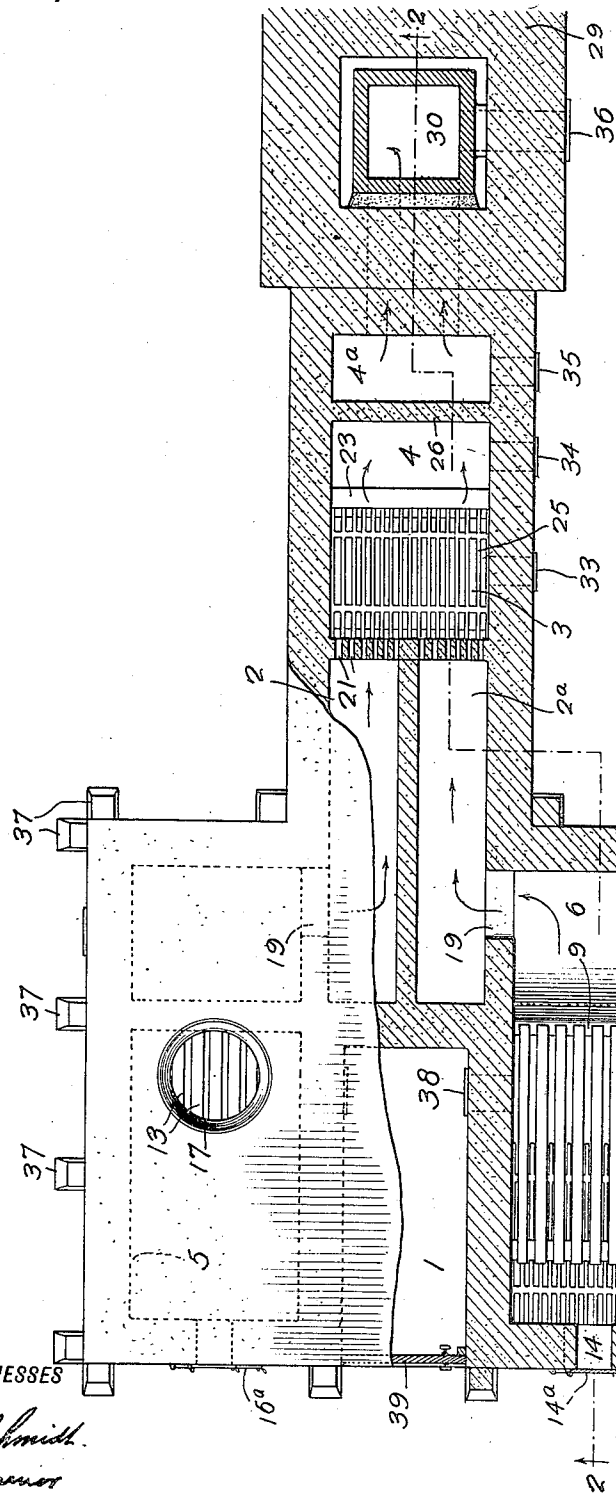


Fig. 1.

WITNESSES

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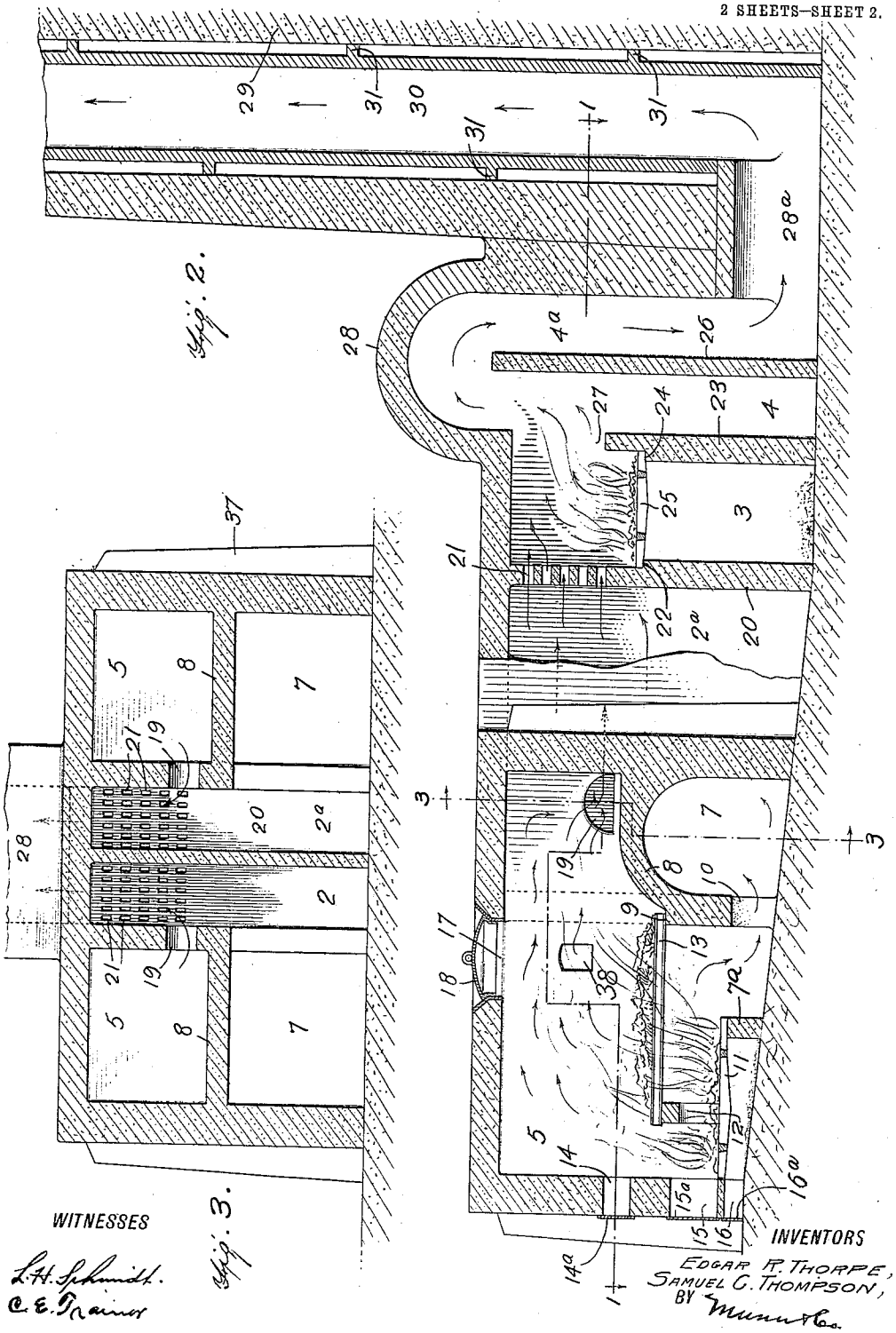


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

EDGAR R. THORPE AND SAMUEL C. THOMPSON, OF LAKIN, KANSAS.

GARBAGE-INCINERATOR.

1,070,209. Specification of Letters Patent. Patented Aug. 12, 1913.

Application filed December 18, 1912. Serial No. 737,406.

To all whom it may concern:

Be it known that we, EDGAR R. THORPE and SAMUEL C. THOMPSON, citizens of the United States, and residents of Lakin, in the county of Kearny and State of Kansas, have invented a new and useful Improvement in Garbage-Incinerators, of which the following is a specification.

Our invention is an improvement in garbage incinerators, and has for its object the provision of mechanism designed for the destruction, by burning, of garbage and the like, or other combustible organic and inorganic substances and waste products of like character, so designed that the material will be completely consumed in a safe, sanitary and economic manner, and wherein the structure is permanent and of permanent material.

In the drawings:—Figure 1 is a plan view, partly in section, the section being taken on the line 1—1 of Fig. 2, Fig. 2 is a section on the line 2—2 of Fig. 1, and Fig. 3 is a section on the line 3—3 of Fig. 2.

The present embodiment of the invention is preferably built of plastic material capable of hardening, as for instance, concrete or cement, and comprises a plurality of interconnecting chambers, and a chimney. The structure consists of a central portion divided into six chambers, numbered 1, 2, 2^a, 3, 4 and 4^a respectively, and at the front of the said central portion is arranged a lateral portion or extension at each side, each of the said portions being composed of three chambers 5, 6 and 7 respectively. Each of the chambers 5 of the lateral extension or portion is provided with a transverse bridge wall 7^a, intermediate its ends, and with an arch wall 8 at its rear end, the said arch wall having a horizontal shoulder or ledge 9, and a draft opening 10 is provided in the arch wall.

Grate bars 11 are arranged between the front wall of each of the said chambers and the bridge wall 7^a, and an arch wall 12 is arranged transversely of the grate formed by the grate bars 11, the top of the arch 12 being at approximately the level of the ledge 9, before mentioned.

Another series of grate bars 13 is supported on the arch 12 and the ledge 9, the said grate being preferably formed of bars cut from steel rails or other I-beam constructions. The arch 12 is at approximately the center of the grate formed by the bars 11, and door openings 14, 15 and 16 are provided in the front wall of each of the said chambers 5. Doors 14^a, 15^a and 16^a, respectively, are provided for closing the door openings, and the door opening 16 is below the grate bars 11. The door opening 15 is at the level of the top of the grate formed by the bars 11, while the door opening 14 is slightly above the level of the grate bars 13.

An opening 17 is provided in the top of each of the chambers 5 and each of the said openings is closed by a cap 18. Just above the arch 8, each of the chambers 5 communicates with the adjacent compartment 2 or 2^a, as the case may be, by means of a draft opening 19, and the wall 20 that divides the chambers 2 and 2^a from the chamber 3 is provided with draft openings 21, the said openings extending the full width of the said wall and from the top to approximately the level of the bottom of the draft openings 19. The said openings 19 are approximately semi-circular as shown more particularly in Fig. 2.

The wall 20 between the chambers 2, 2^a and 3 is provided with a shoulder or ledge 22 at approximately midway of its height, and the wall 23 that separates the chamber 3 from the chamber 4 is likewise provided with a similar ledge 24, and a grate 25 is supported on the ledges 22 and 24, the said grate extending the full width of the chamber 3. The chamber 4 is separated from the chamber 4^a by means of a transverse wall 26, and the top wall of the central portion is provided with an arch 28 closing the tops of the chambers 4 and 4^a. The said wall 26 extends above the lower face of the top wall of the said central portion, so that the communication between the chambers 4 and 4^a is by means of the arch 28. The wall 23 is provided with an opening 27 at its top for placing the said chamber in communication with the chamber 4.

The chamber 4^a communicates with the outer wall 29 of the chimney, by means of an arch or flue 28^a at the bottom of the said chamber and at the bottom of the chimney. The chimney is composed of the outer wall 29, before mentioned, of plastic material, and an inner wall or casing 30, whose outer face is spaced apart from the inner face of the wall 29, and the said wall 30 is provided with external transverse ribs 31, which engage the outer wall 29 to hold the inner

wall in proper relation with respect to the outer casing or wall.

The opening 17 before mentioned, is in the form of a hopper, and the said opening is the charging hopper for the grate 13. The door openings 14 of the chambers 5 are inspection doors, and other door openings 32—33, 34, 35 and 36 are provided in the chambers 7, 3, 4 and 4^a, and in the flue respectively, each of the said openings being closed by a suitable door.

It will be noticed from an inspection of Fig. 1 that the outer walls of the front portion of the structure are buttressed as indicated at 37 to strengthen the said walls. The two chambers 5 are combustion chambers; the chamber 7 is the liquid chamber, and the chambers 2 and 2^a are the dust chambers. That portion of the chamber 3 above the grate 25 is the auxiliary combustion chamber, while the two chambers 4 and 4^a constitute a gas combustion chamber, the wall 26 acting as a baffle wall. The chamber 4^a communicates with the chimney by means of the flue 28^a.

The chamber 1 is an asphyxiation chamber for the painless destruction of animals as for instance, dogs and the like, and the said chamber communicates with the combustion or heating chambers of the lateral extensions, by means of openings closed by doors 38, and the said chamber is provided with a door opening at its front normally closed by a door 39. The improved incinerator is preferably so arranged that the top thereof will constitute a dumping floor for receiving the material to be incinerated and the said material is passed downwardly through the openings 17 on to the grate bars of the grate 13.

In operation, a fire is first started on the grate 11, the said grate being of cast iron and of a suitable form for burning coal or wood. It will be understood that when the matter to be consumed is sufficiently dry or sufficiently combustible, the fire may be started with the material itself, otherwise a primary fire is started as above mentioned, on the grate 11. It will be understood that before this fire is started a charge of material is passed downwardly on to the grate 13 through the opening 17. The primary fire may be kindled through the door openings 15, while the charge on the grate 13 may be kindled through the inspection door 14. Air enters through the opening 16 and passes upward through the grate 11 and through the grate 13 as indicated by the arrows in Fig. 2, sufficient oxygen being supplied in this matter to thoroughly consume the matter on the grate 13.

The gaseous products of combustion are drawn forwardly and downwardly over the rear part of the grate 11 and through the openings 10 into the chambers 7, from whence they pass directly into the dust chambers 2 and 2^a. The course of the products of combustion is now at right angles to its previous course, and the said products pass through the openings 21 of the wall 20, where they come into contact with the flames in the auxiliary combustion chamber.

The purpose of the openings 19 is to permit the escape of gases arising from decaying organic matter left upon the grate 13; that is, such matter as may accumulate between burnings. These gases are heavy and of foul odor and they may pass rearwardly to the chimney and be diffused at such a height in the atmosphere that they will not be offensive. In addition the openings serve a second function of preventing the accumulation of combustible gases at the rear of the combustion chambers, thus precluding the possibility of explosions in the rear of the said chambers.

As the products of combustion pass into the dust chambers, the gases strike the dividing wall that separates the two chambers, and any mineral or organic matter that may have been carried in suspension is thrown down to the floor, so that the gases pass through the lattice work 21 of the wall 20 free from such material.

The temperature of the gaseous products coming from the main combustion chamber is so great, that any liquid which may have accumulated in the liquid chamber 7 is evaporated and the vapor is carried forward to the auxiliary combustion chamber. The fire is kept burning constantly in the combustion chamber with a fierce heat and at a high temperature, so that the combustible gases are completely consumed and no offensive odor is carried to the chimney.

The auxiliary combustion chamber performs a triple function, being first a combustion chamber and causing second a continuous draft through the entire incinerator, thus preventing the noxious and odorous gases from the putrescible matter in the main chamber when the furnace is idle from escaping into the air near the ground. In addition, since the draft in the chimney is caused by the difference in temperature of the air within the chimney and that without, the auxiliary fire constitutes practically a forced draft.

The gases after passing through the auxiliary combustion chamber strike the baffle wall 26 and are compelled to rise over the said wall to reach the chimney. They are delayed thus so that combustion may be complete. The products of combustion then pass through the flue 28^a to the chimney and are diffused into the air at a sufficient height to prevent offense.

It will be evident that the furnace may be constituted of any number of units, two units being shown in the present instance

and the said structure may be composed of any suitable material, the inner walls being preferably of fire brick or other heat resisting material. One man can easily care for a two unit furnace, disposing of from twenty to thirty tons of garbage per day.

All parts of the furnace are accessible through door openings, the said openings being preferably of sufficient size to admit the body of a man.

We claim:—

1. A garbage incinerator comprising a structure consisting of a central portion having at one end a chimney and having at the other end a lateral extension at each side, each of the said lateral extensions having at the end adjacent to the chimney an arch wall extending transversely of the said extension and having an opening at the bottom of the arch leading from the main portion of the extension to the space beneath the arch, a bridge wall extending transversely of each extension intermediate the front end thereof and the arch, a grate supported by the bridge wall and the front wall of the extension, an arch extending transversely of the grate intermediate the ends thereof, a grate supported on the arch and on the arch wall, each extension having a feed hopper in its top above the last-named grate and having openings in the front wall for permitting access to the grates and to the space beneath the grates, a closure for each of the said openings, the central portion being separated by transverse partition walls into a plurality of chambers, the foremost chamber communicating with the lateral extensions and being adapted for use as an asphyxiation chamber, the succeeding chamber of the central portion being divided by a central longitudinal wall into a plurality of dust chambers, one of the said chambers being adjacent to an extension and having a communication therewith above the first-named arch, the chamber succeeding the dust chambers being an auxiliary combustion chamber the rear wall of each dust chamber having a plurality of openings near the top thereof, for placing each of the said dust chambers in communication with the auxiliary combustion chamber, a grate arranged transversely of the said auxiliary combustion chamber below the openings, the rearmost chamber having an arch in the top thereof extending transversely of the said central portion, a separating wall extending from the bottom of the said rearmost chamber to near the top thereof and dividing the said chamber into a plurality of gas combustion chambers, the gas combustion chamber adjacent to the chimney communicating therewith at the bottom of the chamber and the chamber remote from the chimney communicating with the auxiliary combustion chamber above the grate, each of the said chambers having openings in its outer wall near the bottom thereof, and a closure for each of the said openings.

2. A garbage incinerator comprising a structure composed of a central portion having at one end a chimney and having at the other a lateral extension at each side, each extension having an arch wall at the end adjacent to the chimney, the axis of the arch being transverse to the said extension and said arch having an opening at the bottom thereof leading from the main portion of the extension to the space beneath the arch, each extension having a feed opening in its top, a grate beneath each of the said feed openings for receiving the matter to be incinerated, a grate in front and below the first-named grate, each extension having openings in its front wall to permit access to the grates, the central portion having a dust chamber adjacent to each extension, and having an opening leading from each dust chamber to the space beneath the arch and having an opening leading to the extension above the arch at the rear of the extension, said central portion having an auxiliary combustion chamber in rear of the dust chambers and communicating therewith and having a gas combustion chamber in rear of the auxiliary combustion chamber and communicating therewith at the top of the said auxiliary combustion chamber and communicating with the chimney at the bottom of the said chimney, and a baffle wall arranged transversely of the gas combustion chamber, said wall being spaced apart from the top of the gas combustion chamber.

3. A garbage incinerator comprising a central portion having at one end a chimney and at the other a lateral extension at each side thereof, each of the said extensions having a feed opening in its top and having a grate below the opening for receiving the matter to be incinerated, the central portion having a dust chamber adjacent to each extension and communicating therewith at the rear of the said extension and near the top thereof, said central portion having an auxiliary combustion chamber in rear of the dust chambers and communicating therewith, said central portion having a gas combustion chamber between the auxiliary combustion chamber and the chimney, said chamber communicating with the auxiliary combustion chamber near the top of the said chamber and with the chimney near the bottom of the chimney, a baffle wall arranged transversely of the gas combustion chamber and spaced apart from the top thereof, each of the lateral extensions having an arch at its rear end whose axis is transverse to the extension, said arch having an opening in its front and communicating with the adjacent dust chamber at the inner end of the arch.

4. A garbage incinerator comprising a

main combustion chamber having an opening in its top and having a grate below the opening for receiving the matter to be incinerated, an arch at the rear of the said combustion chamber, said arch having an opening in its front, the incinerator having a dust chamber at the inner end of the arch, the combustion chamber communicating with the dust chamber above and below the arch, said incinerator having an auxiliary combustion chamber in rear of the dust chamber and communicating with the dust chamber near the top thereof, said incinerator having a gas combustion chamber between the auxiliary combustion chamber and the chimney and communicating with the chimney near the bottom thereof and with the auxiliary combustion chamber near the upper end thereof, and a baffle wall arranged transversely of the said gas combustion chamber and spaced apart from the top thereof.

5. A garbage incinerator comprising a main combustion chamber having a grate and having a feed opening above the grate for receiving the matter to be incinerated, a dust chamber adjacent to the main combustion chamber, an auxiliary combustion chamber having a grate, the dust chamber communicating with the auxiliary combustion chamber above the level of the grate, a gas combustion chamber with which the auxiliary combustion chamber communicates above the grate, a baffle wall in the gas combustion chamber, and a chimney with which the gas combustion chamber communicates at the bottom thereof, an arch arranged transversely of the rear end of the main combustion chamber and having an opening at its front, the main combustion chamber communicating with the dust chamber above and below the arch.

6. A garbage incinerator comprising a combustion chamber having a grate and a feed opening above the grate for receiving the matter to be incinerated, a dust chamber communicating with the combustion chamber for receiving the products of combustion, an auxiliary combustion chamber with which the dust chamber communicates, and a gas combustion chamber with which the auxiliary combustion chamber communicates, said gas combustion chamber having a transverse baffle wall extending from the bottom thereof to near the top, and an arch arranged transversely of the rear end of the combustion chamber and communicating with the said chamber at its front, the combustion chamber communicating with the dust chamber above and below the arch.

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