

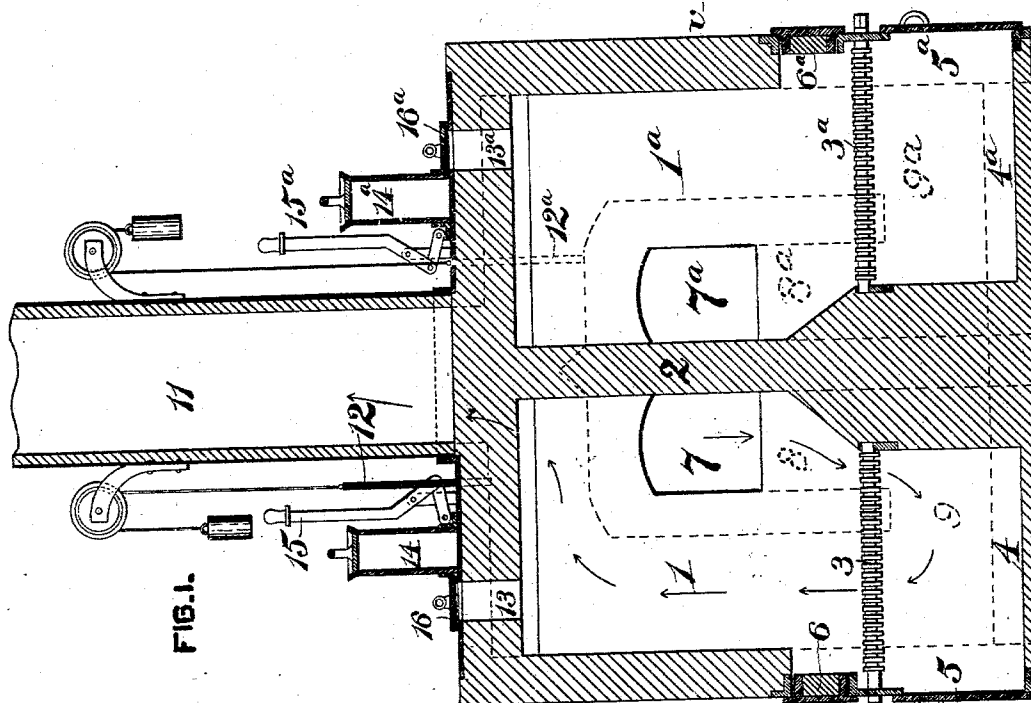
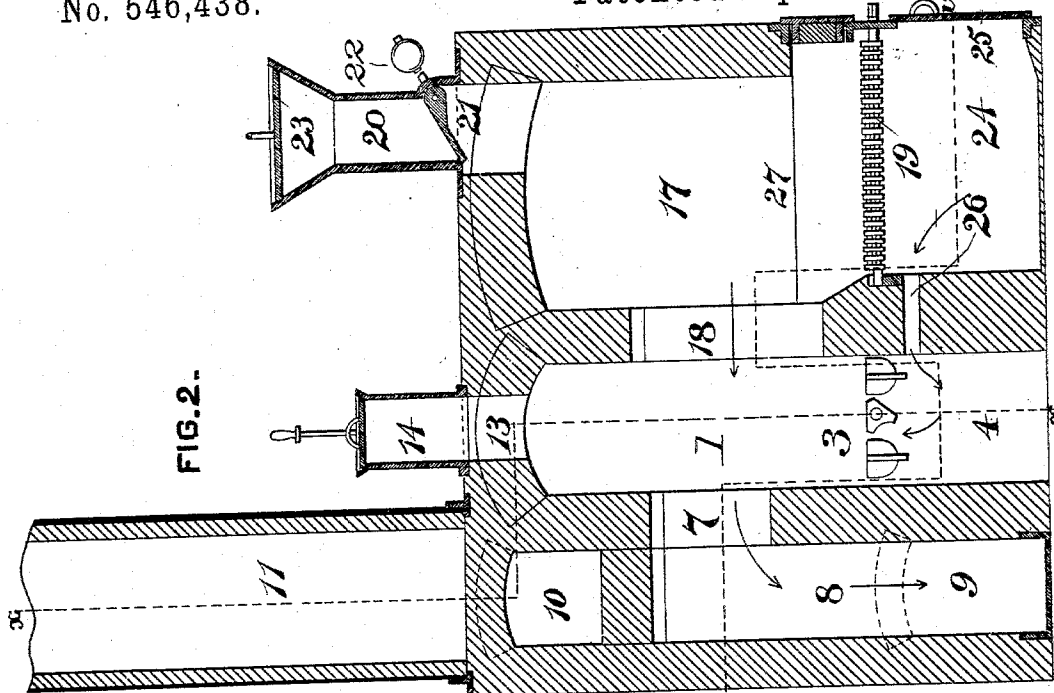
(No Model.)

3 Sheets—Sheet 1.

W. SWINDELL.
GARBAGE FURNACE.

No. 546,438.

Patented Sept. 17, 1895.



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(No Model.)

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FIG. 3.

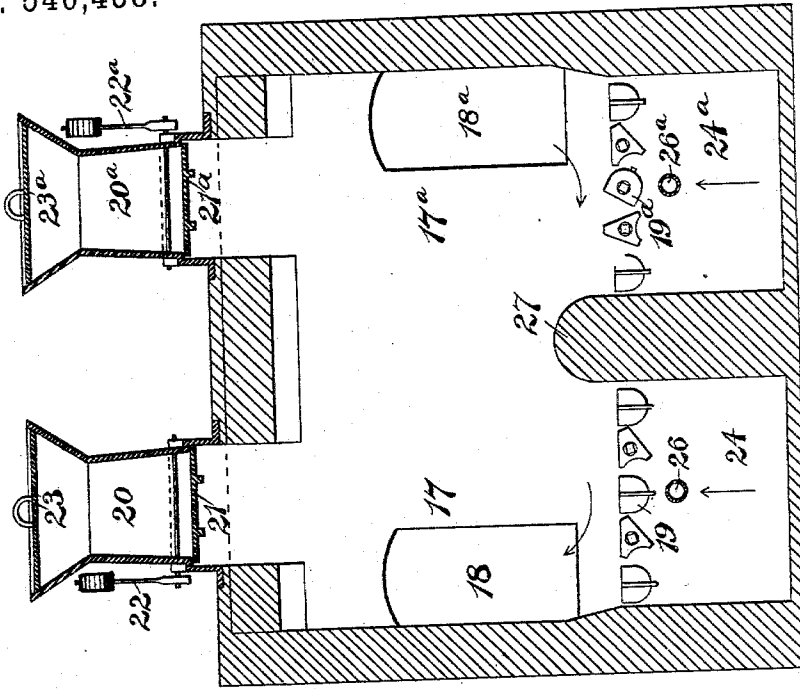
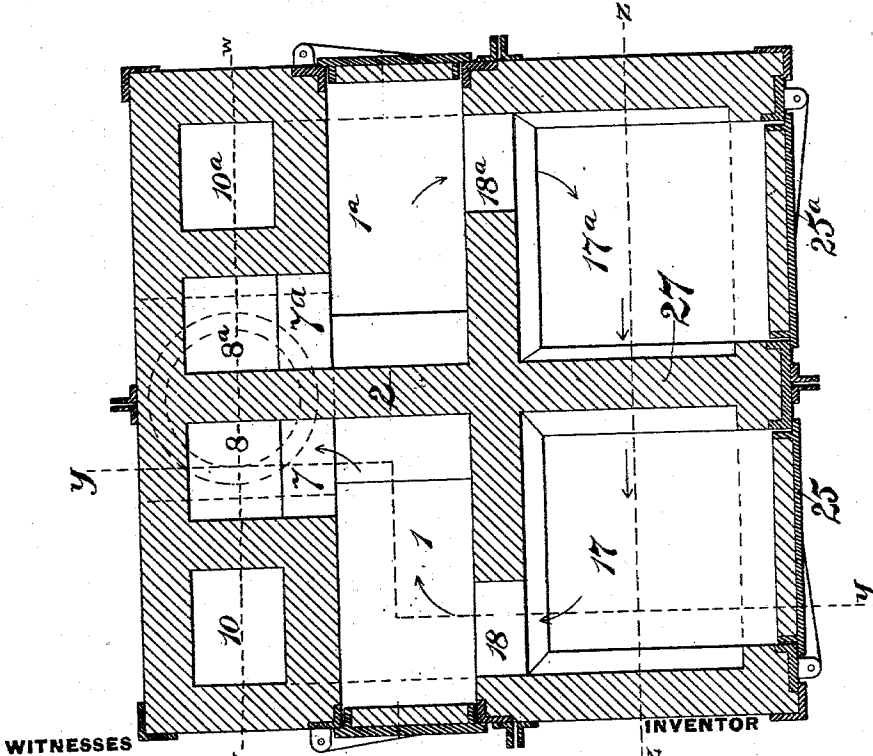


FIG. 4.



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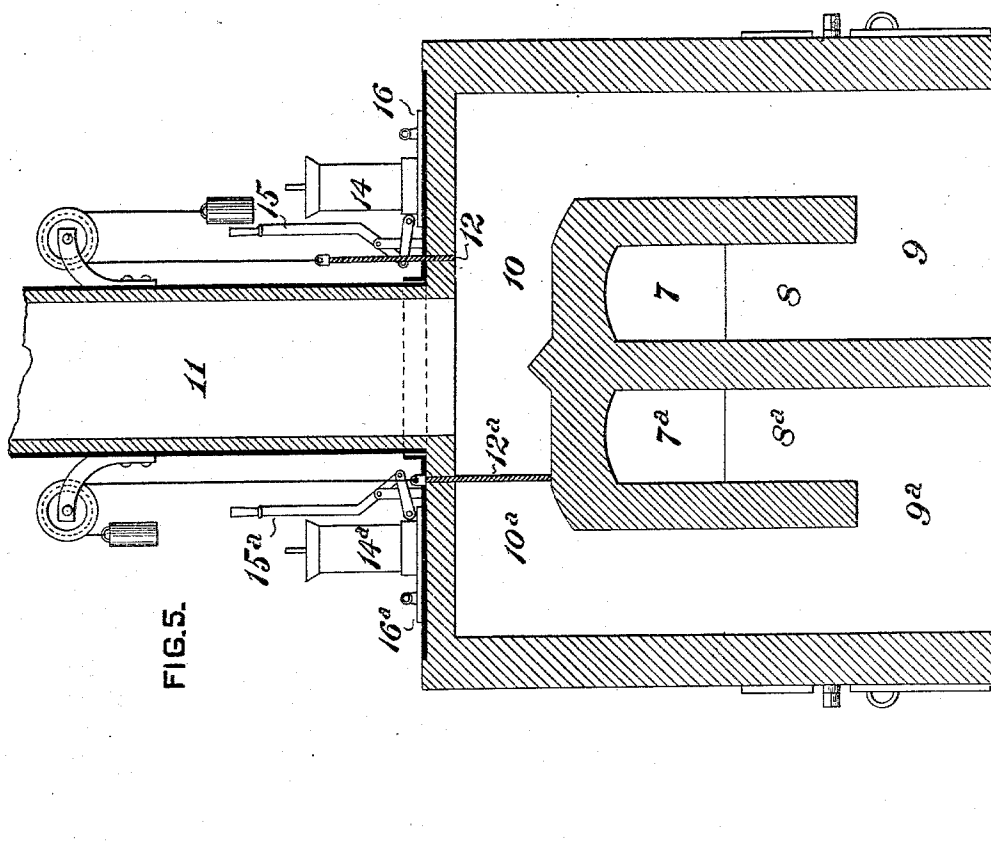
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UNITED STATES PATENT OFFICE.

WILLIAM SWINDELL, OF ALLEGHENY, PENNSYLVANIA.

GARBAGE-FURNACE.

SPECIFICATION forming part of Letters Patent No. 546,438, dated September 17, 1895.

Application filed June 21, 1893. Serial No. 478,413. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SWINDELL, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Garbage-Furnaces, of which improvements the following is a specification.

The invention described herein relates to certain improvements in furnaces for destroying garbage, and has for its object the provision, in a furnace, of two primary combustion or fire chambers in which a high degree of heat is generated by the combustion of a suitable fuel, and a secondary combustion-chamber in which the garbage is charged and through which and through the primary chambers in alternately opposite directions the products of combustion from the primary chambers are passed for the combustion of the garbage.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of my improved furnace, the plane of section being indicated by the line *x x*, Fig. 2. Figs. 2 and 3 are similar views, the planes of section being indicated by the lines *y y* and *z z*, respectively, of Fig. 4. Fig. 4 is an irregular sectional plan view, the planes of section being indicated by the irregular line *v v*, Fig. 2; and Fig. 5, a vertical transverse section at the line *w w* of Fig. 4.

In the practice of my invention two primary combustion or fire chambers 1 and 1^a are located end to end and separated by a wall 2. These chambers are provided with grate-bars 3 3^a and with ash-pits 4 4^a, which are closed by doors 5 5^a. In the front walls of these chambers are formed openings, which are normally closed by doors 6 6^a, said openings being designed for the insertion of tools for cleaning and stirring the fuel on the grate-bars. Through the rear walls of the chambers 1 1^a are formed openings 7 7^a for the passage of the products of combustion into the downtake-flues 8 8^a, whence they flow through the horizontal flues 9 9^a and the uptake-flues 10 10^a to the stack 11. The uptake-flues are provided with valves 12 12^a, which may be alternately closed and opened, as here-

inafter described. The fuel is charged into the chambers 1 1^a through openings 13 13^a, preferably by means of hoppers 14 14^a, which are shifted into and out of register with the openings 13 13^a by means of levers 15 15^a. When the hoppers are shifted out of register with the openings for the purpose of charging the hoppers with fuel, the openings 13 13^a are closed by plates 16 16^a, which are preferably attached to the hoppers so as to be movable therewith, thereby keeping the openings constantly closed and preventing the escape of gases.

The secondary or garbage chambers 17 17^a are located each at one side of one of the primary chambers 1 1^a and communicate therewith through openings 18 18^a, respectively. These chambers 17 17^a are provided with grate-bars 19 19^a for supporting the garbage which is charged into the chambers through the hoppers 20 20^a. These hoppers are closed at their lower ends by pivoted doors 21 21^a, which are held in a closed position by weighted levers 22 22^a. The upper ends of the hoppers are closed by removable covers 23 23^a, so as to prevent the escape of gases from the chambers when the doors 21 21^a are lowered to drop a charge into the chambers.

The ash-pits 24 24^a are made fluid-tight as regards their sides and bottoms and are hermetically closed by doors 25 25^a, so that any liquid which may be charged into the chambers 17 17^a may be retained in the ash-pits, and being vaporized by the heat in the chambers the vapor will flow through the openings 26 26^a into the ash-pits 4 4^a and pass thence up through the grate-bars 3 3^a.

In the operation of my improved furnace, after the fires in the primary chambers are well ignited, garbage is charged into the secondary chambers and one of the valves, as 12^a, is closed, the other valve 12 being open, so that the products of combustion from one of the primary chambers, as 1^a, will flow through the opening 18^a into and through the garbage-chambers and consume the material therein. The gases generated by the combustion of the garbage escape through the opening 18 into the chamber 1, and passing over the highly-heated fire-bed in said chamber all unconsumed gases will be burned and noxious or injurious vapors destroyed. The products of

combustion pass from the chamber 1 through the opening 7 into the flues leading into the stack. When the garbage in the chamber 17^a has been thoroughly consumed, a new charge is placed therein, and the valves 12 and 12^a reversed, so that the heat and products of combustion will flow from chamber 1, over the partially burned and dried charge in chamber 17, over the fresh charge in chamber 17^a, partially burning and drying the same, and thence over the bed of hot fuel in chamber 1^a, whence it flows through the flues to the stack. As soon as the charge in chamber 17 is consumed, a fresh charge is placed therein, and the valves again reversed. It will be observed that the openings 18 18^a, connecting the primary and secondary chambers, are so located that the products of combustion from the primary chambers must traverse the entire length of the secondary chambers before escaping into the primary chambers; and similarly the openings 18 18^a and 7 7^a are so located that any gases entering from the secondary chambers must traverse the entire length of the bed of fuel in the primary chambers before escaping to the stack. The object of the alternate action of the apparatus as above described is to enable the entire charge of garbage in the secondary chambers to be thoroughly and uniformly consumed throughout. The action of the products of combustion from either of the primary chambers is strongest upon the garbage in the adjacent portion of the nearest secondary chamber, and as the products part with heat in passing through said chamber and adjoining chamber the garbage in the latter, or a portion of it, may not be fully consumed. By reversing the direction of traverse of the products of combustion which are admitted from the other primary chamber their strongest action is exerted upon the partially-consumed garbage nearest thereto to fully burn and dry the same, and as their heat becomes reduced they pass over material on which there is proportionately less necessity for their action. The material advantage of this operation, as compared with one in which the heated products pass into and through a chamber or chambers in one direction only, is the utilization to a high degree of the heat of the products of combustion before their escape into the stack and a very complete and thorough consumption of the combustible elements of the successive charges of garbage supplied to the secondary chambers.

It is preferred that a quantity of water should be placed in the flues 9 9^a, so as to extinguish any ignited material which may escape from the primary chambers. It will be observed that the partial partition 27 between the secondary or garbage chambers 17 17^a is

comparatively low, so that the products of combustion passing from one chamber will impinge upon the charge in the other chamber. The principal function of the low partition-wall is to keep the charges in the two chambers separate and while it is preferred to employ this separating-wall it may be omitted, throwing the two chambers into one and depending upon the separate hoppers to keep the charges apart. Similarly the two ash-pits may be thrown into one by omitting the separating-wall.

I claim herein as my invention—

1. In a garbage furnace, the combination of two primary combustion chambers, a secondary garbage chamber, passages connecting the secondary chamber at or near its ends with the primary chambers, a stack, discharge passages leading from the ends of the primary chambers opposite those which communicate with the secondary chamber to the stack, and valves controlling communication between the discharge passages and stack, substantially as set forth.

2. In a garbage furnace, the combination of two primary combustion chambers, grates in said combustion chambers, ash pits below said grates, a secondary garbage chamber, passages connecting the secondary garbage chamber at or near its ends with the primary chambers, a closed ash pit below the secondary chamber, a stack, discharge openings leading from the primary combustion chambers to the stack, valves controlling communication between the discharge passages and stack, and passages leading from the ash pit of the secondary chamber to the ash pits of the primary chambers, substantially as set forth.

3. In a garbage furnace, the combination of two primary combustion chambers, a secondary garbage chamber communicating at its ends therewith, a partition extending across the lower portion of the secondary chamber, and forming a division wall between two ash pits below the same, supply hoppers communicating with the top of the secondary chamber near its ends, a grate located below the top of the partition in the secondary chamber, a stack, discharge opening leading from the primary combustion chambers to the stack, valves controlling communication between the discharge passages and stack, and passages each leading from one of the ash pits of the secondary chamber to one of the primary chambers, substantially as set forth.

In testimony whereof I have hereunto set my hand.

WILLIAM SWINDELL.

Witnesses:

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