

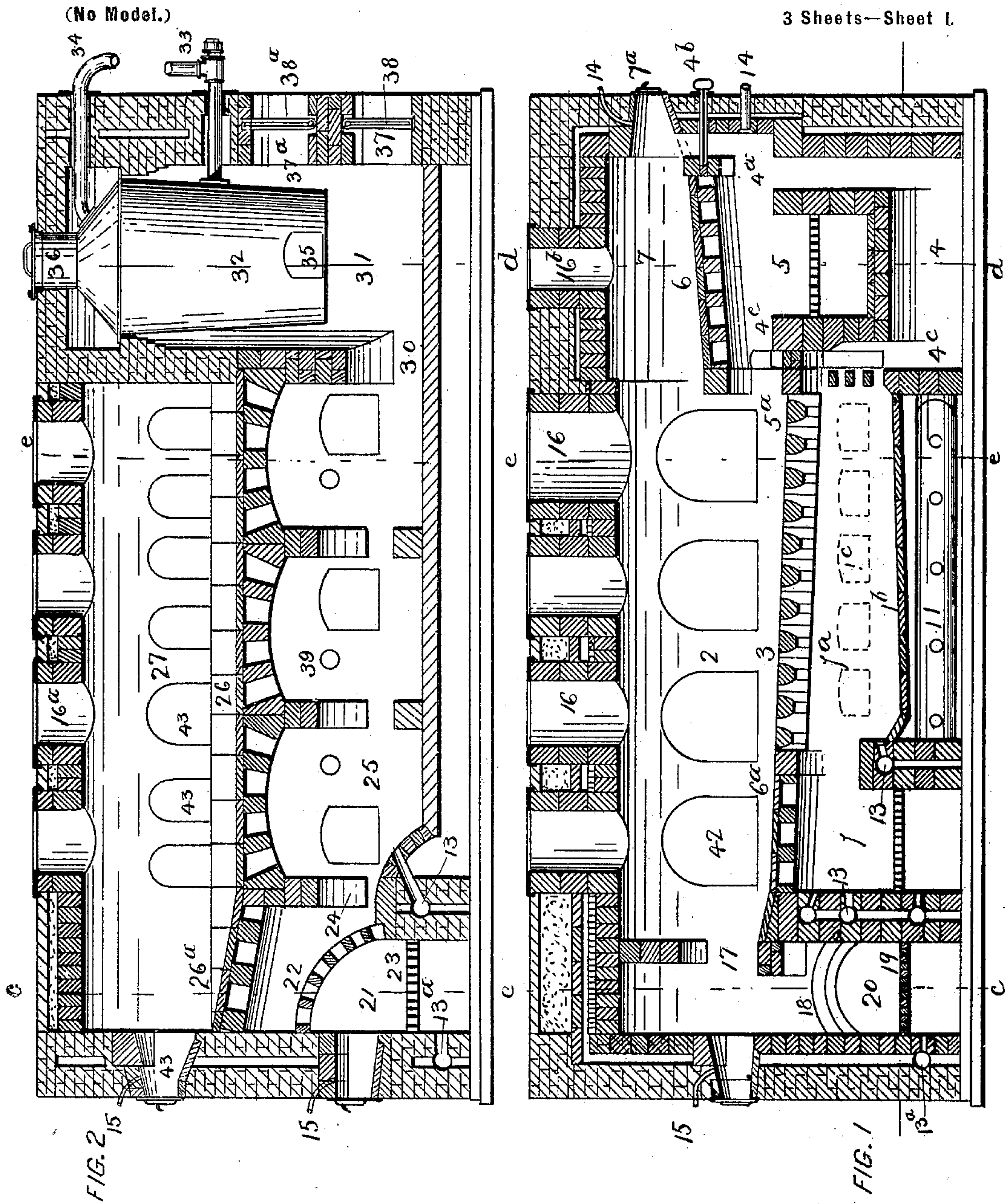
No. 699,635.

Patented May 6, 1902.

R. ROBINSON.
CREMATOR FOR REFUSE.

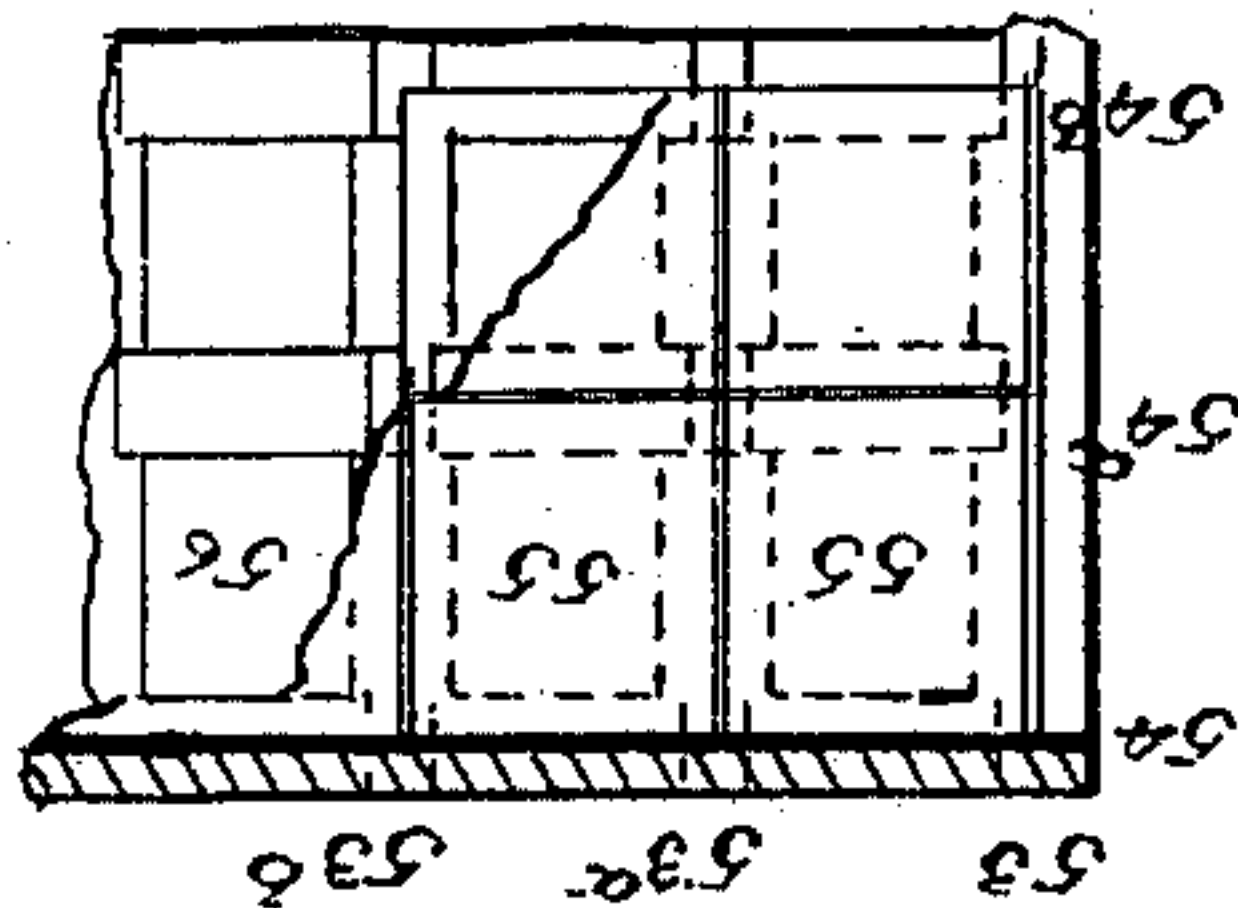
(Application filed May 25, 1909.)

3 Sheets—Sheet 1.



WITNESSES
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FIG. 10



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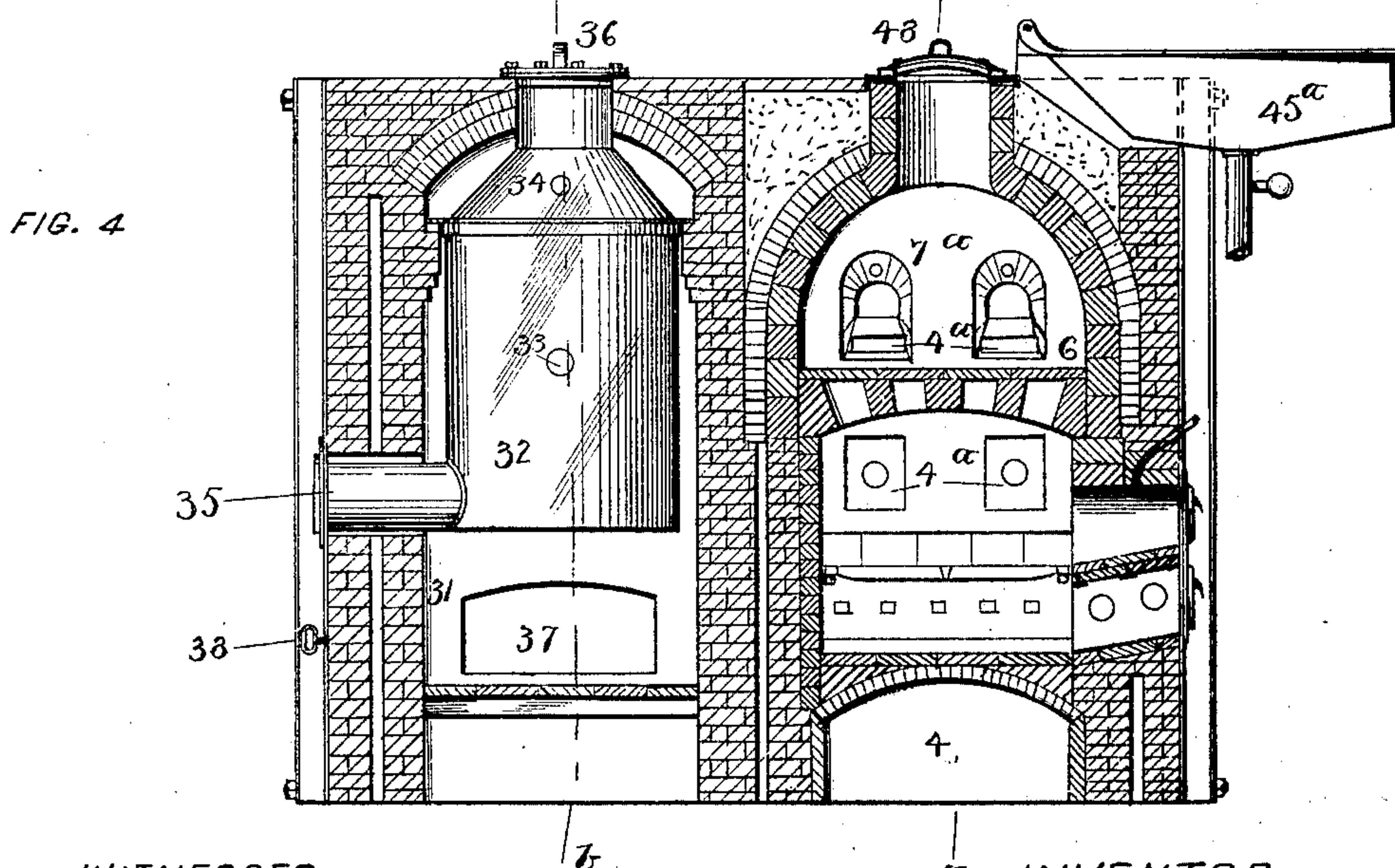
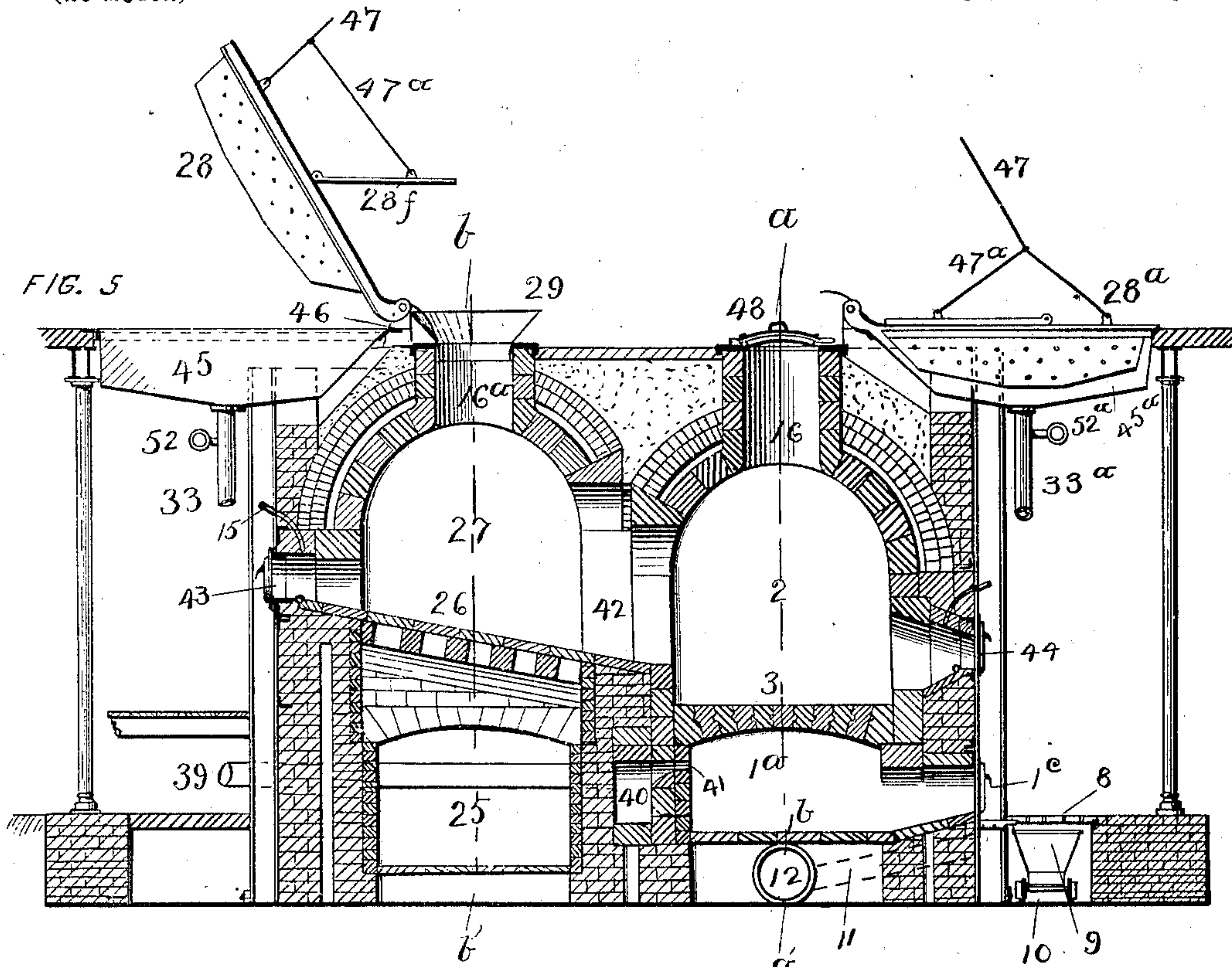
Patented May 6, 1902.

R. ROBINSON.
CREMATOR FOR REFUSE.

(Application filed May 25, 1899.)

(No Model.)

3 Sheets—Sheet 3.



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CREMATOR FOR REFUSE.

SPECIFICATION forming part of Letters Patent No. 699,635, dated May 6, 1902.

Application filed May 25, 1899. Serial No. 713,244. (No model.)

To all whom it may concern:

Be it known that I, ROBERT ROBINSON, a citizen of the United States of America, and a resident of Portland, Multnomah county, State of Oregon, have invented certain new and useful Improvements in Cremators for Refuse, of which the following is a specification.

My invention relates to cremators for the destruction or garbage, waste, and other refuse matter.

My primary object in conceiving my improvements was to minimize the time and incidental labor and fuel consumed in the operation of the cremator with a view to economy and also to obtain the best sanitary results.

It has heretofore been the practice to dump the refuse matter to be cremated directly into the burning-chamber or furnace. There is a serious objection to this practice, for usually the refuse matter contains a considerable amount of moisture, which reduces the temperature in the burning-chamber and retards the process of cremation, requiring more time and fuel, and consequently more expense. I reduce this objectionable feature to a minimum by the introduction of two preliminary steps or treatments of the refuse before discharging the same into the burning-chamber. The first of such steps or treatments consists in draining the excessive moisture off the refuse in a suitable contrivance constituting an appurtenance and part of my cremator, and the second step consists in drying such refuse before throwing the same into the cremating-chamber to render the same as combustible as possible, such drying being done in a chamber for that purpose provided and heated by radiation by the heat produced in the cremation-chambers. The first step above stated may be omitted, if thought preferable, at any time, my cremator being so arranged that the use of the drainage appurtenance is optional, and the refuse may be thrown directly into both the drying and burning chambers, all dry and combustible matter being placed immediately in the main burning-chamber to augment combustion and save fuel.

Figure 1 is a longitudinal vertical section,

through the center on line *a a*, of the lower and upper burning-chambers, a transverse section of which is seen in the right half of Figs. 3, 4, and 5. Fig. 2 is a longitudinal vertical section, through the center on line *b b*, of the heat-escape passage and drying-chamber, a transverse section of which is seen in the left half of Figs. 3, 4, and 5. Fig. 3 is a vertical cross-section through coking-chamber and fire-box on line *c c*, Figs. 1 and 2, leading to heat-escape passage 25 beneath drying-chamber 27 and water-evaporating tank or retort 32. Fig. 4 is a vertical cross-section through fire-box, drying and burning table over same, and water-evaporating tank or retort, the section being taken on line *d d*, Figs. 1 and 2. Fig. 5 is a vertical cross-section taken on a line *e e* extending vertically through Figs. 1 and 2 and shows in elevation the draining and dumping tanks and the lower main burning-chamber, heat-escape passage 25, drying-chamber 27, charge or feed holes, and the dust and gas collecting duct 12, leading to smoke-stack. Fig. 6 is a vertical section taken diametrically through the self-sealing cover for charge or feed holes. Fig. 7 is a perspective elevation of the receiving, draining, and dumping tank; and Fig. 8 is a like elevation of the catch-basin for the water draining from the garbage introduced in the dumping-tank referred to in Fig. 7. Fig. 9 is a detail of construction for table-arch and drying-floors in burning and drying chambers, and Fig. 10 is a partial plan of the same details seen in Fig. 9.

In its outward appearance my cremator represents an apparatus constructed of incombustible material. In its interior arrangement it comprises a fire-box 1, leading into the primary burning-chamber 1^a, into which the refuse is dropped from the main burning-chamber 2 through the bars or open grating 3 in the floor thereof. The flue 4 passes beneath and communicates with a secondary fire-box 5, such flue 4 having escapes 4^a, respectively controlled by dampers 4^b. The function of the dampers 4^b is to close the escapes 4^a when it is desired to direct the fire under the drying and burning table 6.

Table 6^a is for a like purpose as table 6. Both of these tables occupy spaces which would otherwise be of no use in the burning of refuse and at the same time give increased area for the drying and burning of wet refuse. The table 6 directs the heat from the primary burning-chamber and the secondary fire-box into the main burning-chambers. The position of the tables 6 6^a is such that they receive the full benefit of all the heat produced within the cremator, and for this reason will dry and burn wet refuse faster than the tables 26 and 26^a.

7 7 represent a carbonizing and burning chamber. When the dampers 4^b are closed, the chamber 7 is cut off from any direct fire, but becomes heated by radiation through drying and burning table 6. The chamber 7 also receives some heat from the main burning-chamber 2. When chamber 7 is cut off from direct fire, it is in condition to dry and carbonize the refuse deposited on table 6 to render such refuse in as good combustible state as possible without waste of fuel. The dampers 4^b may thereupon be opened and the fire allowed to reach the carbonized refuse to consume the same. Upon the cremation process having been completed the residuum is stoked off the table 6 and allowed to fall through the grate-bars 3 on the ash-pan 1^b at the bottom of burning-chamber 1^a. This is a water-tight pan. The ashes are removed from the pan 1^b by means of an ash-hoethrough doors 1^c, of which there are a series in the working side of primary burning-chamber, the position of such doors being indicated in dotted outlines in Fig. 1. The ashes are then raked onto a grating 8, separating the unconsumable bulky matter from the ashes, the latter dropping into a car 9, running on rails in a passage 10 for that purpose provided. Connected with the passage 10 are a series of air pipes or ducts 11, communicating with a larger air pipe or duct 12, which in turn communicates with the flue or main smoke-stack. The object of this arrangement is to remove by the air-suction so produced all dust and odors rising from the ashes, the air drawn through the grate 8 also keeping the same sufficiently cool, so that it may be walked on by attendants. The grating 8 is adapted to be lifted in parts to leave openings through which the bulky unburned refuse can be discharged into cars 9. To promote combustion, air is introduced through pipes 13 14 15.

In the main burning-chamber 2 the cremation of the bulk of the refuse takes place, the fires from the two independent fire-boxes 1 and 5 being led into such chamber. All refuse which is in a fairly-dry state may be thrown directly into the chamber 2 through charging-holes 16. The smoke and gases generated in chamber 2 escape through passage-way 17 into coking-chamber 18 or third independent fire-box, (see also Fig. 3,) which is partially filled with coal deposited upon a solid table. From the chamber 18 the smoke and gases referred

to, together with that given off by the coking coal, escapes through passage 20 into coke fire-box and gas-burning chamber 21, the gases being completely burned in passing from chamber 21 through a checkered opened arch 22. The coked coal is shoved from the table 19 and allowed to burn on a grate 23 in the bottom of the fire-box 21. The hot gases or products of combustion issue from the fire box or chamber 21 and are conducted through a passage-way 24 into the "extension-chamber" 25, Fig. 2, so called, because the larger area of this chamber allows the gases escaping from the confinement of passage-way 24 to expand, retarding their travel through the chamber 25 and causing them to more thoroughly impart their heat to the inclined tables 26 of the drying-chamber 27. Into the latter chamber wet refuse is dumped from dumping and draining tank 28 through charging-holes 16^a. A removable hopper or funnel 29 is used for emptying the contents of tanks 28 28^a down the charging-holes 16^a. The heat from the chamber 25 passes through passage-way 30 into tank-chamber 31 and is there again utilized in heating the tank 32 and evaporating the water draining into such tank from dumping and draining tanks 28 and 28^a through suitable pipes, the receiving and discharging ends of which alone are shown and indicated by 33 33^a. The steam produced in tank 32 passes out and is conveyed through pipe 34 into pipe 13^a beneath fire-grate 23, the connecting-pipe not being shown. The tank 32 has a clean-out 35 and removable cover 36. The waste heat from chamber 25 finally escapes through passage-ways 37 37^a, provided with dampers 38 38^a, into smoke-stack.

39 shows pipe-section through which air is supplied to expansion-cells 40, from which the air is fed through a number of small openings 41 into primary burning-chamber 1^a.

42 represents arched passage-ways through which the dried refuse is stoked off the table 26 into main burning-chamber 2 and distributed over the opened grating 3. The stoking of the refuse on table 26 is done through holes 43, having removable covers or doors, and like holes 44, also having removable covers or doors, allow the stoking of the refuse on grating in main burning-chamber.

The charging-hole 16^b is for the purpose of charging the carbonizing and burning chamber 7 over table 6.

4^c, Fig. 1, shows one of two small flues extending laterally and perpendicularly and communicating with passage 5^a from passage or flue 4. Such flues 4^c are provided with dampers, and the function thereof is to provide an auxiliary escape for the gases from primary burning-chamber 1^a to main burning-chamber 2.

In Figs. 7 and 8 I show details of the receiving, draining, and dumping tanks 28 28^a and of the catch-basins in which such tanks are contained. The functions of the former

are suggested in the compound name given the same, which is to say the catch-basin seen in Fig. 8 and designated by 45 45^a in Figs. 4 and 5 are placed stationary in connection with body of cremator, being suspended from horizontal girders, (not shown,) and within such basin rest the tanks 28 28^a, having perforated sides and bottoms adapting the same to drain the water off the wet refuse thrown therein. These tanks are made of sheet-steel and have flanges 28^b, resting on the rim of the catch-basin, such flanges being angle-irons bolted to the sides of the tank, and ears 28^c, through which extend rods 28^d, whereby said tanks are hinged to rests 46 on the girders supporting the catch-basins. Said tanks are provided with a cover 28^e, having a hinged lifting part 28^f for opening the tank to receive and for discharging the refuse. The tanks 28 28^a are lifted by means of cables or chains 47, running over pulleys to point of power, and are divided at the end in two, so as to be adapted to fasten to ears 28^e. A short chain 48 is attached at one end to the ear 28^h on the lifting part of the cover and the other end thereof being connected with the cable 47, so that when raising the tanks 28 28^a the lifting-section 28^f of the cover will automatically be opened. This operation is shown in Fig. 5 at 28.

Fig. 6 shows a detail of the construction of the covers 48. This comprises a cast-iron outer casing 48^a, to the bottom of the rim of which is bolted a ring 48^b, supporting a tile lining 49. The rim of said cover is provided with a flange 50, resting in a groove 51^a, filled with sand or other suitable sealing substance, in a ring 51 for that purpose provided. The rings 51 are affixed to the mouths of the charging-holes 16 16^a.

52 52^a are two pipes communicating with and ventilating the drain-pipes 33 33^a from basins 45 45^a and leading to a suction-fan, by the action of which the air and gases therein drawn are forced through pipes 39 into the primary burning-chamber 1^a. By the same means odors are prevented from rising from the refuse deposited in the tanks 28 28^a.

Fig. 9 is a perspective plan, and Fig. 10 is a plan, of the construction of the tables 6 6^a 26 26^a. This construction is one of the features of my invention. The use of these tables has been already stated, and it will be remembered that the table 6 is provided to receive refuse that has been drained, but is still quite wet. The table 6^a is for the same purpose, and the tables 26 26^a are also for the same purpose, but placed within drying-chamber 27. With such use in view my object was to obtain a table of strong construction and yet adapted to offer as little resistance to and become readily heated by the radiated heat. The arches supporting the tables are built to allow for expansion without producing open joints in the floors. The arches comprise the transverse courses, as 53 53^a 53^b, which furnish the bearing strength of the arches, and

the longitudinal courses 54 54^a 54^b, which furnish the binding strength. On the upper surface of these courses are placed the tiles 55 for the flooring, having lips on all four sides for lapping over each other, as seen in Fig. 9. The center of the lap-joints of the tiles will come over the center of the bearing and binding courses. Any opening in the joints of the courses due to expansion, it is apparent, will be in the longitudinally-extending binding courses. Large openings 56 are left between the intersecting courses, through which the heat can reach the tile flooring.

Now what I claim is—

1. The combination in a cremator of a lower or primary fire-box and burning-chamber, an upper or main burning-chamber extending over the primary fire-box and burning-chamber, a portion of the base of the upper or main chamber over the primary fire-box being a tile flooring or table, and the remainder an open grating, a second independent fire-box, a communicating passage-way or flue between the said primary and main burning-chambers, passing under and around such second fire-box, a drying and burning table as 6 located over the second fire-box, and a branch flue extending around and over said table, which branch flue may be closed, the main burning-chamber communicating with the smoke-stack, substantially as set forth.

2. The combination in a cremator of a lower or primary fire-box and burning-chamber, an upper or main burning-chamber extending over the primary fire-box and burning-chamber, a portion of the base of the upper or main chamber over the primary fire-box being a tile flooring or table and the remainder an open grating, a second independent fire-box, a communicating passage-way or flue between the said primary and main burning-chambers, passing under and around such second fire-box, a drying and burning table as 6 located over the second fire-box, and a branch flue extending around and over said table which branch flue is controlled by a damper whereby such branch flue may be closed, the main burning-chamber communicating with the smoke-stack, there being suitable charge-holes in the roof of such burning-chamber, and over the burning-table, through which to throw the refuse, substantially as set forth.

3. The combination in a cremator of a lower or primary fire-box and burning-chamber, an upper or main burning-chamber extending over the primary fire-box and burning-chamber, a portion of the base of the upper or main chamber over the primary fire-box being a tile flooring or table and the remainder an open grating, a second independent fire-box, a communicating passage-way or flue between the said primary and main burning-chambers, passing under and around such fire-box, a drying and burning table as 6 located over the second fire-box, and a branch flue extending around and over said table, which branch flue is controlled by a damper whereby such

branch flue may be closed, the main burning-chamber communicating with the smoke-stack, a series of doors in the working sides of the primary burning-chamber for the removal of ashes, and a grated elevated platform, as 8, extending beneath, outside of, said doors, there being suitable charge-holes in the roof of such burning-chamber, and over the burning-table, through which to throw refuse, substantially as set forth.

4. The combination in a cremator of a lower or primary fire-box and burning-chamber, an upper or main burning-chamber extending over the primary fire-box and burning-chamber, a portion of the base of the upper or main chamber over the primary fire-box being a tile flooring or table and the remainder an open grating, a second independent fire-box, a communicating passage-way or flue between the said primary and main burning-chambers, passing under and around such second fire-box, a drying and burning table, as 6, located over the second fire-box, and a branch flue extending around and over said table, which branch flue is controlled by a damper whereby such branch flue may be closed, the main burning-chamber communicating with the smoke-stack, a series of doors in the working side of the primary burning-chamber for the removal of ashes, and a grated elevated platform, as 8, extending beneath, outside of, said doors, there being suitable charge-holes in the roof of such burning-chamber, and over the burning-table, through which to throw refuse, a series of pipes or ducts as 11, the outer ends of which extend beneath said elevated platform and are connected with means causing an air-suction through such pipes, for removing the odors and dust occasioned by pulling the ashes and unburned refuse out of the primary burning-chamber onto said platform, substantially as set forth.

5. The combination in a cremator of a lower or primary fire-box and burning-chamber, an upper or main burning-chamber extending over the primary fire-box and burning-chamber, a portion of the base of the upper or main chamber over the primary fire-box being a tile flooring or table and the remainder an open grating, a second independent fire-box, a communicating passage-way or flue between the said primary and main burning-chambers, passing under and around such second fire-box, a drying and burning table as 6 located over the second fire-box, and a branch flue extending around and over said table which branch flue is controlled by a damper whereby such branch flue may be closed, a third independent fire-box, as 18, connected by a passage-way with the main burning-chamber and the smoke-stack, there being suitable charge-holes in the roof of such burning-chamber and over the burning-table 6 through which to throw the refuse, substantially as set forth.

6. The combination in a cremator of a lower or primary fire-box and burning-chamber, an upper or main burning-chamber extending

over the primary fire-box and burning-chamber, a portion of the base of the upper or main chamber over the primary fire-box being a tile flooring or table and the remainder an open grating, a second independent fire-box, a communicating passage-way or flue between the said primary and main burning-chambers, passing under and around such second fire-box, a drying and burning table, as 6, located over the second fire-box, and a branch flue extending around and over said table which branch flue is controlled by a damper whereby such branch flue may be closed, a third independent fire-box, as 18, connected by a passage-way with the main burning-chamber, said third fire-box comprising two contiguous independent compartments connected with each by an intermediate passage-way, one being a coking-chamber, having a closed floor and the other being a burning-chamber with grating floor, and there being a checker-arch within the said burning-chamber, an expansion-chamber 25, connected by passage-ways with the said third fire-box 18, and having a suitable damper-controlled heat-escape, a drying and burning chamber 27 located above said expansion-chamber 25, having a closed floor and connected by passage-ways with the main burning-chamber 2, there being suitable charge-holes for throwing the refuse into the cremator, substantially as described.

7. The combination in a cremator of a lower or primary fire-box and burning-chamber, an upper or main burning-chamber extending over the primary fire-box and burning-chamber, a portion of the base of the upper or main chamber over the primary fire-box being a tile flooring or table, and the remainder an open grating, a second independent fire-box, a communicating passage-way or flue between the said primary and main burning-chambers, passing under and around such second fire-box, a drying and burning table as 6 located over the second fire-box, and a branch flue extending around and over said table, which branch flue is controlled by a damper whereby such branch flue may be closed, a third independent fire-box as 18 connected by a passage-way with the main burning-chamber, said third fire-box comprising two contiguous independent compartments connected with each by an intermediate passage-way one being a coking-chamber, having a closed floor and the other being a burning-chamber with grating floor, and there being a checker-arch within the said burning-chamber, an expansion-chamber 25, connected by passage-ways with the said third fire-box 18 and communicating with chamber as 31, provided with a tank for receiving, and in which to evaporate water drained from the receiving and dumping tanks, said chamber 31 having a suitable damper-controlled heat-escape, a drying and burning chamber 27 located above said expansion-chamber 25 having a closed floor and connected by passage-ways with the main burning-chamber 2, there being suitable

charge-holes for throwing the refuse into the cremator, each of said charge-holes being provided with a suitable receiving or dumping tank adapted to discharge its contents through such charge-holes and to drain its contents into a catch-basin, for such purpose provided, the catch-basin having a pipe for conveying the water collected into the evaporating-tank, substantially as described.

8. The combination in a cremator of a lower or primary fire-box and burning-chamber, an upper or main burning-chamber extending over the primary fire-box and burning-chamber, a portion of the base of the upper or main chamber over the primary fire-box being a tile flooring or table and the remainder an open grating, a second independent fire-box, a communicating passage-way or flue between the said primary and main burning-chambers, passing under and around such second fire-box, a drying and burning table, as 6, located over the second fire-box, and a branch flue extending around and over said table whereby such branch flue may be closed, a third independent fire-box, as 18 connected by a passage-way with the main burning-chamber, said third fire-box comprising two contiguous independent compartments connected with each by an intermediate passage-way one being a coking-chamber, having a closed floor and the other being a burning-chamber with grating floor, and there being a checker-arch within the said burning-chamber, an expansion-chamber 25, connected by passage-ways with the said third fire-box 18 and communicating with chamber as 31, provided with a tank for receiving, and in which to evaporate water drained from the receiving and dumping tanks, said chamber 31 having a suitable damper-controlled heat-escape,

a drying and burning chamber 27 located above said expansion-chamber 25 having a closed floor and connected by passage-ways with the main burning-chamber 2, there being suitable charge-holes for throwing the refuse into the cremator, each of said charge-holes being provided with a suitable receiving or dumping tank adapted to discharge its contents through such charge-holes and to drain its contents into a catch-basin, for such purpose provided, the catch-basins having pipes as 33, 33^a for conveying the water collected into the evaporating-tank, and means for producing an air-suction through said catch-basins and drain-pipes 33 33^a for removal of the offensive gases and conveyance of the same into a burning-chamber to be there consumed, substantially as described.

9. The combination in a refuse-furnace of the receiving-hopper emptying into the charge-hole, the catch-basins in which such hopper rests, and the cover for the hopper, of means for lifting such hopper at an end and simultaneously therewith its cover, substantially as described.

10. In a cremator, or furnace, the combination of the combustion-chamber, a superimposed heating-chamber, and an intermediate, or dividing table or floor consisting of bearing courses, binding courses intersecting the former, and lipped tiles covering the openings between such intersecting courses, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

ROBT. ROBINSON.

Witnesses:

H. R. ROBINSON,
T. J. GEISLER.