

No. 644,505.

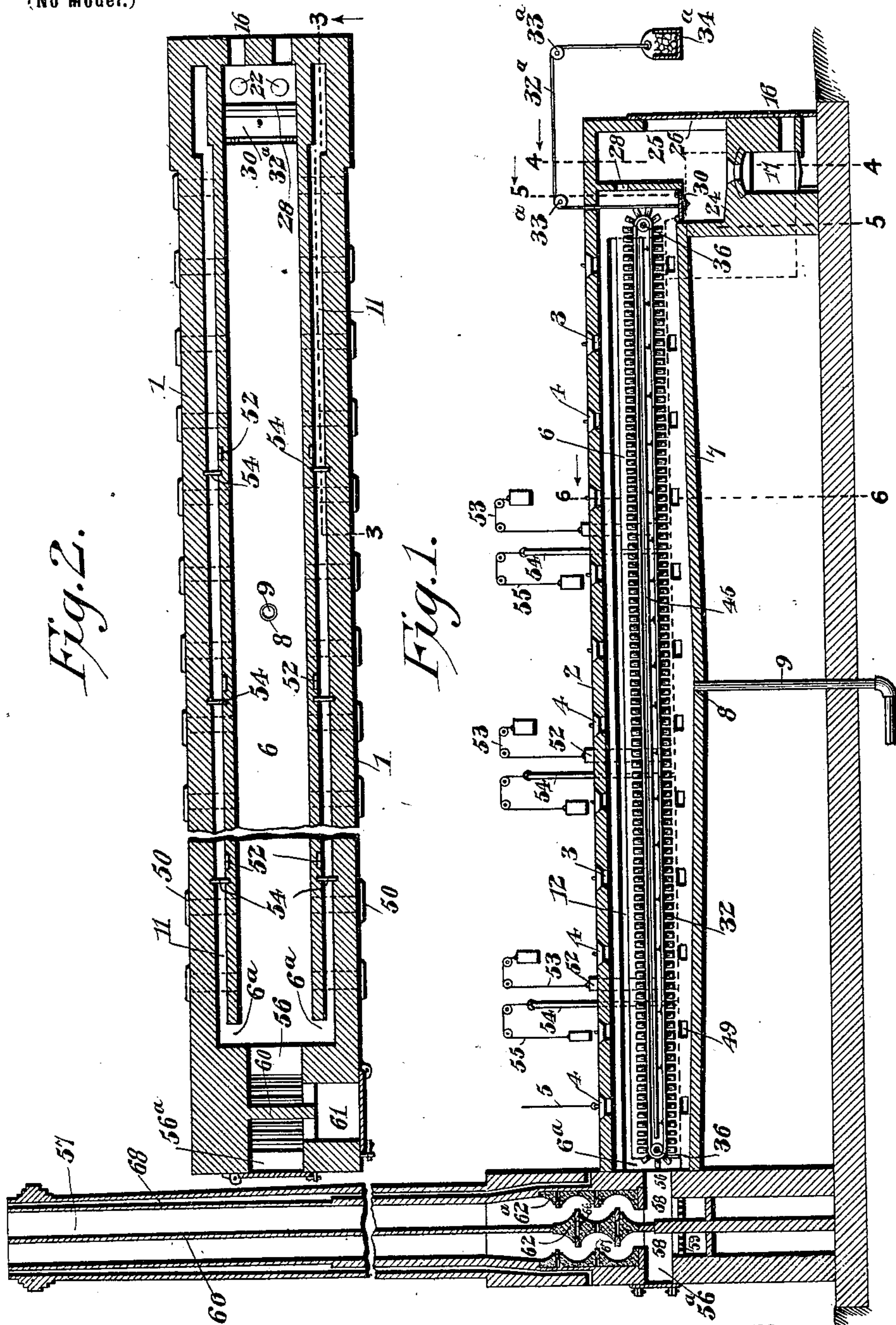
Patented Feb. 27, 1900.

S. W. DIXON.
GARBAGE FURNACE.

(Application filed Oct. 17, 1898.)

5 Sheets—Sheet 1.

(No Model.)



Witnesses

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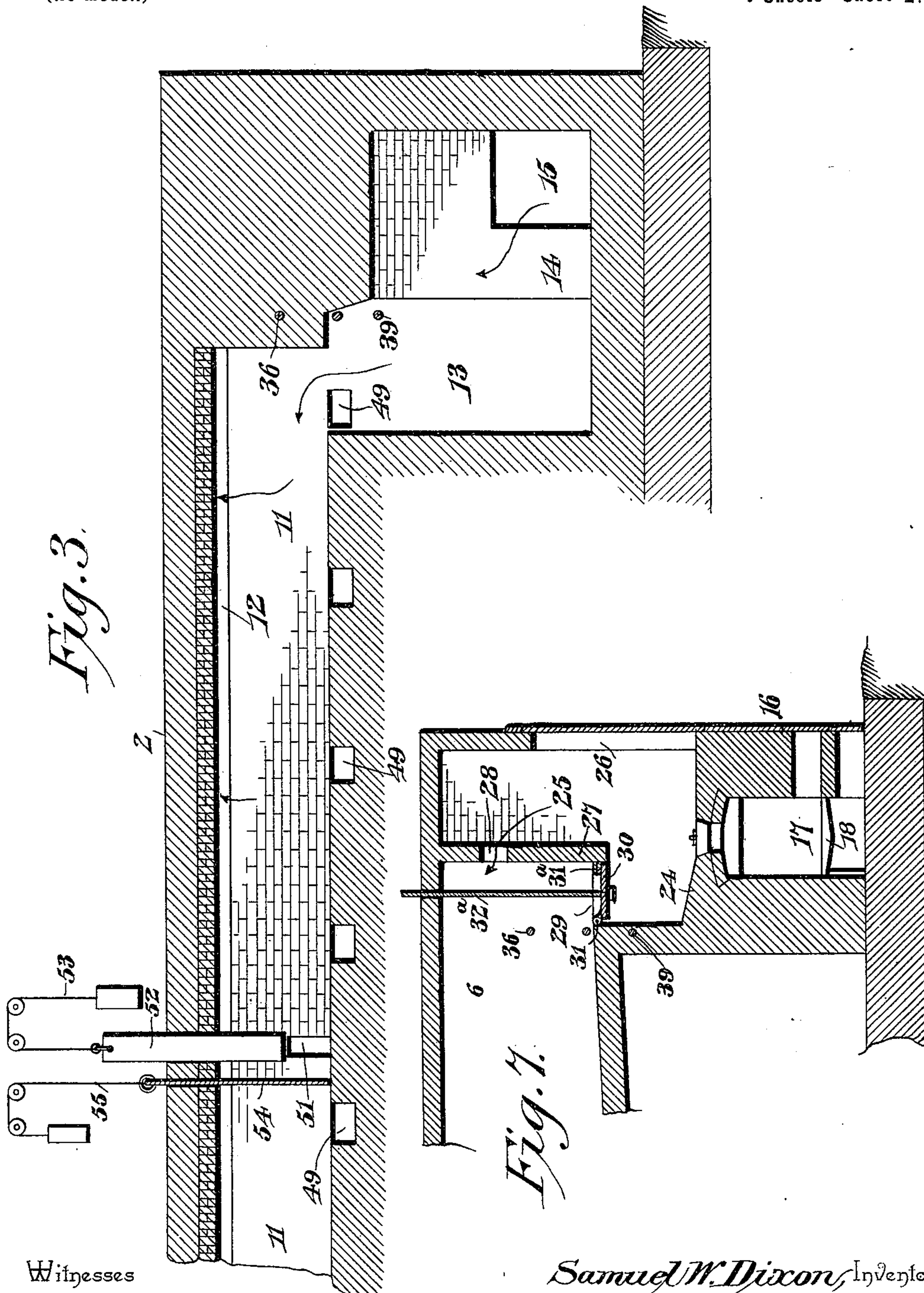
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5 Sheets—Sheet 2.



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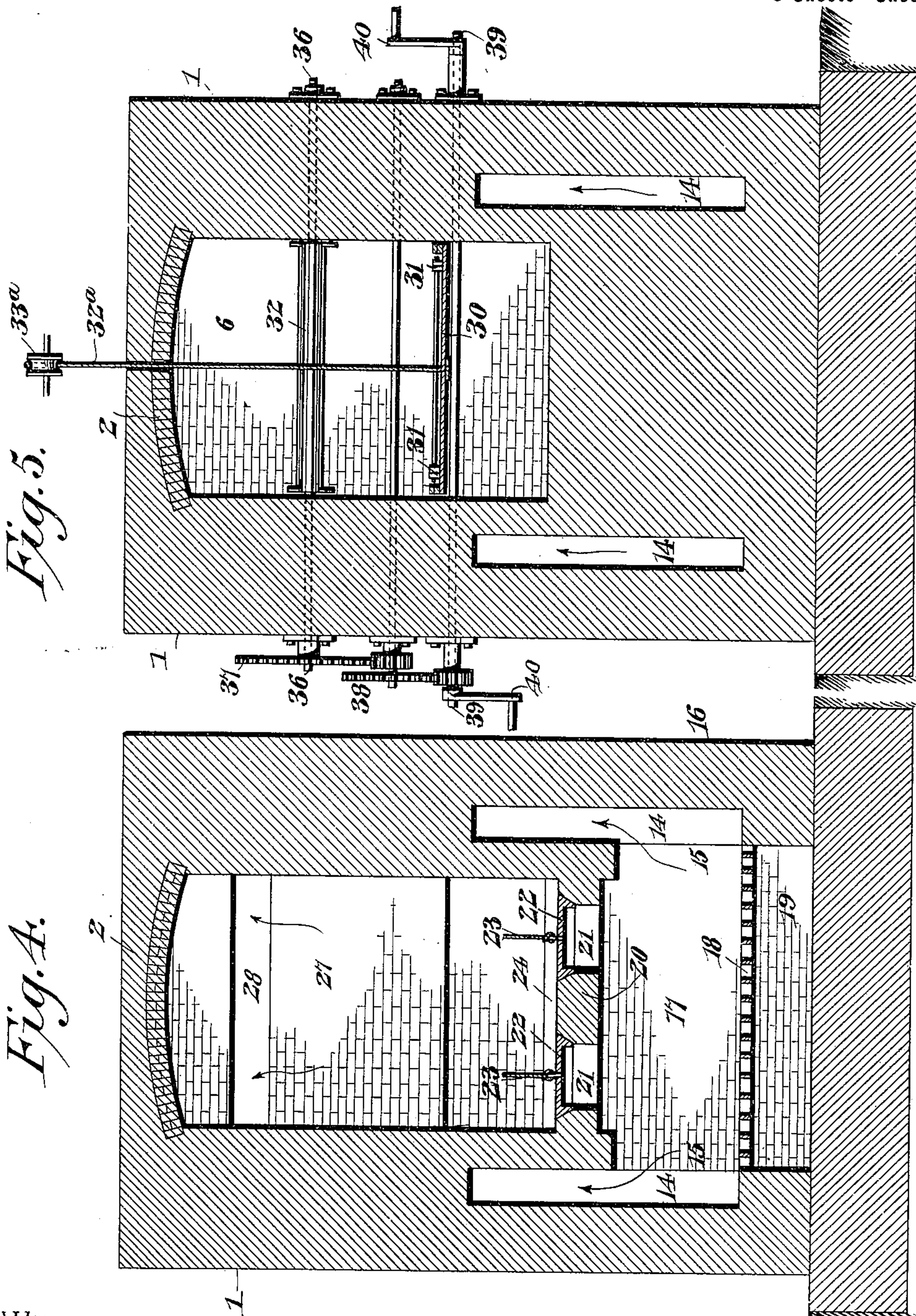
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Fig. 5.

Fig. 4.



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5 Sheets—Sheet 4.

Fig. 8.

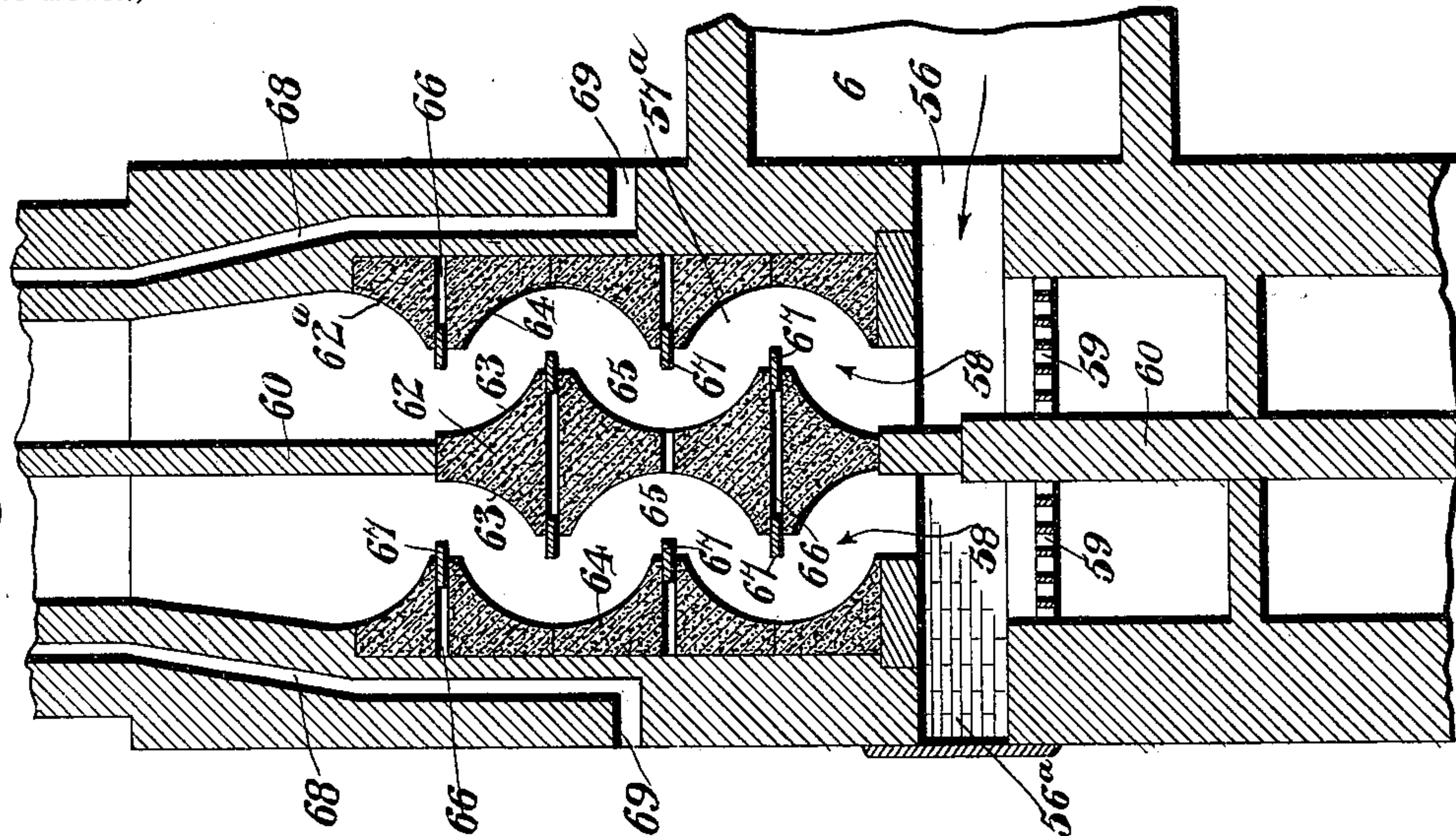
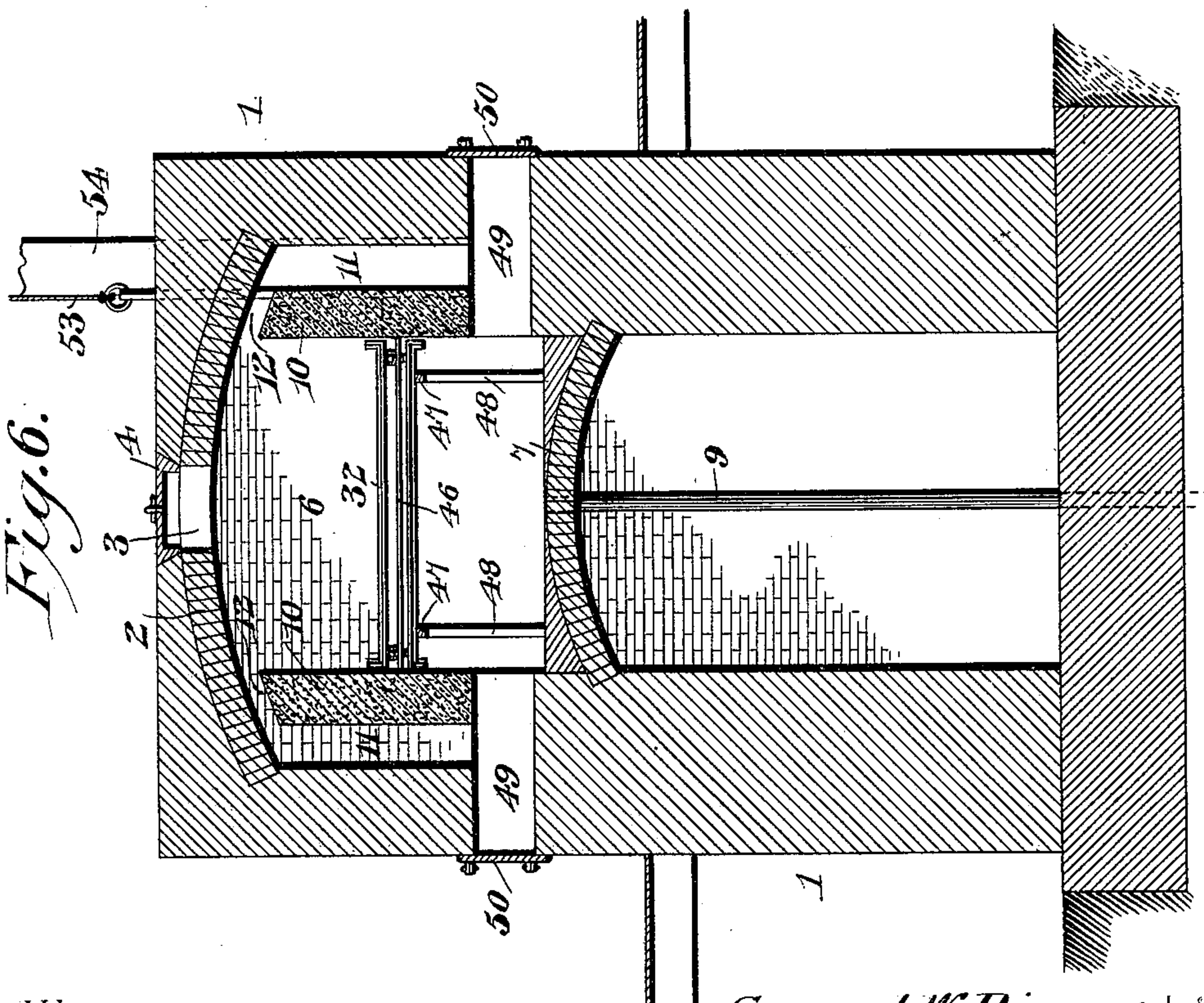


Fig. 6.



Witnesses

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5 Sheets—Sheet 5

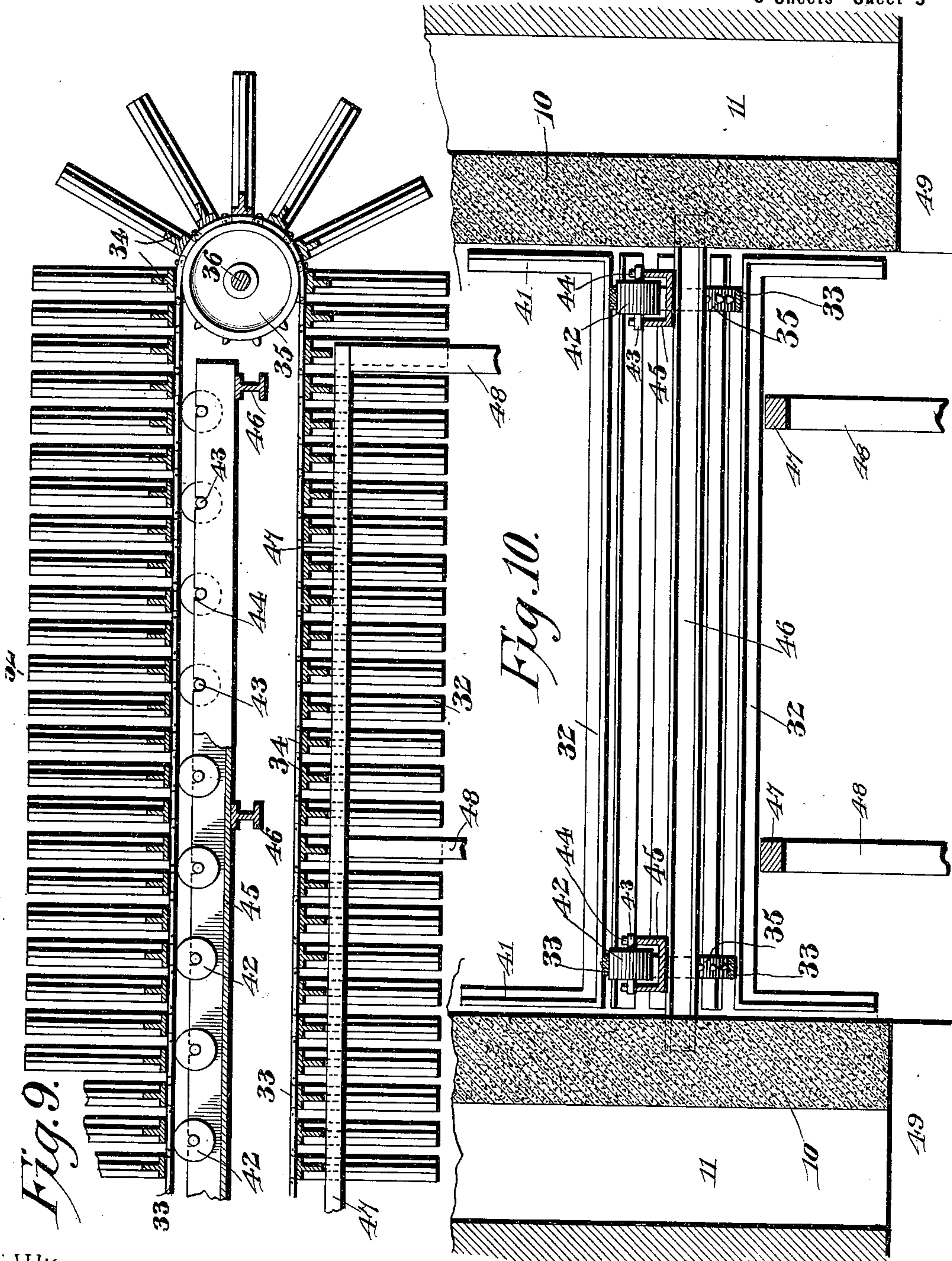


Fig. 9.

Fig. 10.

Witnesses

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UNITED STATES PATENT OFFICE.

SAMUEL W. DIXON, OF FINDLAY, OHIO.

GARBAGE-FURNACE.

SPECIFICATION forming part of Letters Patent No. 644,505, dated February 27, 1900.

Application filed October 17, 1898. Serial No. 693,767. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL W. DIXON, a citizen of the United States, residing at Findlay, in the county of Hancock and State of Ohio, have invented a new and useful Garbage-Furnace, of which the following is a specification.

This invention relates to crematories of that type known as "garbage-furnaces," which are specially designed for consuming in large quantities the garbage and refuse of cities and towns.

To this end the main and primary object of the present invention is to construct a garbage-furnace in a simple and durable manner with a minimum number of parts and having means for thoroughly and effectively drying and burning garbage, night-soil, dead bodies, and other wet and offensive matter.

The invention also contemplates a construction of furnace providing for a thorough separation of the liquid and solid matter and the drying of the solid matter to utilize the same as fuel for keeping up the fire of the main consuming or cremating chamber.

The invention further contemplates an improved construction of furnace having means for protecting the garbage-platform from the direct action of the fire, while at the same time providing for an effective circulation and distribution of the heat to the garbage on the garbage-platform, whereby a thorough drying thereof by evaporation is accomplished.

Another important feature of the invention is an improved construction of platform for supporting the garbage while being dried in the evaporating-chamber and which platform not only serves to provide for separating the liquid from the solid matter, but also acts in the capacity of a supporting-carrier for delivering the garbage when dried to the feeding-point, where it is delivered to the main cremating or combustion chamber.

The invention also contemplates a novel and efficient construction of scent-consumer within the stack of the furnace to provide for the complete combustion of combustible vapors and the thorough deodorization of odoriferous gases, whereby all scent incident to the operation of the furnace is entirely destroyed and the gases which issue out of the stack are

entirely eliminated of foul-smelling and poison-laden gases.

Other important objects of the invention will readily appear to those skilled in the art as the nature of the invention is more fully understood; and the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

While the invention is necessarily susceptible to a variety of modifications without departing from the scope thereof, still the preferred embodiment thereof is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal sectional view of a complete garbage-furnace constructed in accordance with the present invention. Fig. 2 is a horizontal longitudinal sectional view, omitting the garbage-carrier from the evaporating-chamber. Fig. 3 is a vertical longitudinal sectional view of a portion of the furnace, taken on the line 3 3 of Fig. 2 and exposing the passages connecting the longitudinal side heat-flues with the main cremating or combustion chamber. Fig. 4 is a transverse sectional view on the line 4 4 of Fig. 1. Fig. 5 is a similar view on the line 5 5 of Fig. 1. Fig. 6 is a similar view on the line 6 6 of Fig. 1. Fig. 7 is an enlarged detail view of the front end portion of the furnace-casing, including the cremating or combustion chamber. Fig. 8 is an enlarged vertical sectional view of the scent-consuming combustion-chamber in the stack. Fig. 9 is an enlarged longitudinal sectional view of a portion of the garbage-carrier. Fig. 10 is an enlarged detail transverse sectional view of the garbage-carrier, showing the adjacent protective fire-brick walls at the sides thereof.

Referring to the accompanying drawings, the numeral 1 designates a furnace-casing built in any suitable length, according to the required capacity of the furnace, and said casing is preferably built of masonry braced or stayed in any suitable manner and formed with an arched closed top portion 2, provided therein with a longitudinal series of feed-openings or manholes 3, through which the garbage to be burned is introduced and which openings or manholes are normally closed tightly by the manhole-covers 4, which preferably have a suitable counterbalanced

connection 5 therewith to facilitate the opening and closing thereof; but as this kind of connection is well known in the art the same is simply indicated in Fig. 1 of the drawings in connection with one of said covers 4.

The furnace-casing 1 is arranged horizontally and is of the usual elongated form, and in the present invention the entire interior of the casing from end to end thereof is formed into a continuous evaporating-chamber 6, within which chamber a separation of the solid and liquid matter takes place, as well as a thorough drying of the garbage, to remove all moisture and prepare the same for use as fuel.

The longitudinal closed evaporating-chamber 6, which extends longitudinally from end to end of the furnace-casing, is inclosed at the bottom by a bottom drain floor or basin 7. This drain floor or basin 7 is formed at the bottom of the evaporating-chamber and is imperforate, so as to retain the liquid matter thereon, and is downwardly convergent to a central point, where the same is provided with a drain-opening 8, to which is connected one end of a drain-pipe 9, leading to a sewer or other point of discharge for the liquid matter to be drained out of the evaporating-chamber.

The longitudinal evaporating-chamber 6 of the casing has built up therein at its opposite inner sides the protective fire-brick radiating-walls 10, which are spaced from the main side walls of the casing to form at the opposite sides thereof the longitudinal side heat-flues 11, which extend the full length of the evaporating-chamber and substantially the full length of the furnace-casing itself. The opposite inner fire-brick walls 10 are arranged parallel with each other at opposite sides of the casing and have their upper edges terminate short of the crown of the evaporating-chamber to form the continuous longitudinal upper heat-circulating passages 12, which provide communication between the flues 11 and the interior of the evaporating-chamber at the upper opposite sides of the latter. The side heat-flues 11 are provided at their rear ends with circulating-openings 6^a, communicating with the interior evaporating-chamber 6, so that only a portion of the heat which is circulated therein passes into said chamber 6 through the passages 12. The front ends of the said side heat-flues 11 communicate with the vertical passages 13, formed in the main side walls of the furnace-casing at the front end thereof and opening into the side heat-channels 14, into which the fire and heat pass from the side flue-openings 15, formed in opposite sides of the cremation or combustion chamber 16, built within the furnace-casing at the extreme front thereof and having no direct communication with the evaporating-chamber 6, except through the side heat-flues 11 in the manner explained.

The main cremating or combustion chamber 16 is formed with the usual fire-box 17, having arranged therein the fire-grate 18, be-

neath which is located the ash-pit 19, and said ash-pit as well as the fire-box have the usual door-inclosed openings communicating therewith at the front end of the furnace. In the present invention, however, the said cremating or combustion chamber 16 is made sufficiently large, so as to accommodate all of the garbage that is dried and ready for fuel, as well as to accommodate therein on its fire dead bodies and the like which cannot be conveniently handled on the movable platform or carrier arranged within the evaporating-chamber and which will be presently referred to. The said cremating or combustion chamber 16, in addition to the side flue-openings 15, is provided with a closed top portion 20, provided therein with one or more manholes 21, normally inclosed by the manhole-covers 22, which preferably have weighted counterbalance connections 23 therewith, so that the attendant may conveniently uncover the said opening or openings 21 when a fresh supply of dry garbage or refuse matter is to be delivered into the chamber 16. The closed top portion 20 of the cremating or combustion chamber 16 is provided on its upper surface with an inclined floor 24, which declines from the rear portion of the masonry of the chamber toward the opening or openings 21, so as to facilitate the feeding of the dried garbage into the cremating or combustion chamber, and said inclined floor portion at the top of the combustion or cremating chamber 16, forms the bottom of a feeding-compartment 25, built at the front end of the furnace-casing above the chamber 16 and provided with a door-inclosed front opening 26.

The front feeding-compartment 25, above the chamber 16, is inclosed at its rear side by a wall 27, forming the front end wall of the evaporating-chamber 6 and provided therein with a draft-opening 28, which communicates directly with the interior of the evaporating-chamber, so as to admit air and form a draft for carrying the vapors and odor-laden gases to the stack. Directly adjacent to its front end wall 27 and in the bottom thereof the said evaporating-chamber 6 is provided with a discharge-opening 29, which opening is covered and uncovered by a horizontally-arranged vertically-swinging drop-door 30. The drop-door 30 and the opening 29 are arranged in a plane above the inclined floor 24 and at one side of the vertical plane of the opening or openings 21, and said door 30 is hinged at one edge, as at 31, so as to permit its other free edge to drop and deposit the garbage on the floor 24 near the opening or openings 21, so that it can be delivered through such openings into the cremating or combustion chamber 16. The hinged drop-door 30 is held normally closed with its free edge abutting against a stop-bar 31^a by means of a flexible connection 32^a, supported on suitable pulleys 33^a exterior to the furnace-casing, and carrying at its terminal opposite the door a weighted receptacle 34^a, which provides for over-

balancing the door 30 until the same is over-balanced itself by the accumulations of dried garbage, which are delivered on top of the drop-door. When the accumulations of the

garbage are sufficient to overcome the weight of the weighted receptacle 34, the drop-door 30 automatically opens and permits the garbage to fall onto the inclined floor 24.

To provide for the support of the garbage in the evaporating-chamber and the feeding thereof to the discharge-opening 29, there is employed a garbage-carrier 32, arranged longitudinally within the evaporating-chamber above and out of contact with the bottom drain floor or basin 7 and extending in a horizontal direction from one end of the chamber to the other. The garbage-carrier 32 essentially comprises the oppositely-arranged endless carrier-chains 33 and the platform-bars 34, which together form a movable platform or grate for the garbage. The endless carrier-chains 33 are arranged horizontally at opposite sides of the evaporating-chamber next to the protective radiating-walls 10 and are arranged to pass over the oppositely-located pairs of chain-wheels 35, mounted on shafts 36, arranged, respectively, at opposite ends of the evaporating-chamber. The chain-wheel shafts 36, at opposite ends of the evaporating-chamber, are arranged transversely and journaled in suitable bearings fitted to the main side walls of the furnace-casing, and the chain-wheel shaft 36 at the front end of the furnace-casing has mounted on one terminal exterior to the casing a gear-wheel 37, which is geared by a train of gears 38 to an operating-shaft 39, journaled transversely of the furnace-casing and provided on its opposite extremities on opposite sides of the casing with the crank-handles 40, which are grasped by the attendants when it is desired to move the garbage-carrier for delivering the dried portions of the garbage to the discharge-opening. The gearing described is the preferable means employed for communicating motion to the carrier; but it is obvious that other means might be employed for moving the carrier-chains without departing from the spirit of the invention.

The platform-bars 34 are preferably formed of T-strips of metal and are bolted or otherwise rigidly fastened to the opposite carrier-chains, said bars extending transversely across the evaporating-chamber and connecting said opposite chains. The T-platform bars 34 are arranged in a continuous series, side by side, and spaced a short distance apart to provide therebetween drain-spaces forming a grate-surface through which the liquid matter may pass, while at the same time not permitting the main portions of the solid garbage to fall off of the carrier, and the said platform-bars, which thus provide or form a slatted garbage-platform for the garbage to be dried, are provided at their opposite ends with the right-angularly disposed parallel end arms 41, which form inclosing sides for

the platform formed by the series of the bars at the upper side of the carrier.

To provide for the proper support of the upper portion of the garbage-carrier, which forms a movable slotted platform for the garbage, the upper portions of the chains are preferably arranged to rest and work on a longitudinal series of supporting-rollers 42. A series of the supporting-rollers 42 is arranged at each side of the evaporating-chamber between the upper and lower portions of the carrier-chains, and said supporting-rollers have their spindle extremities 43 journaled in bearing-notches 44, formed in the upper side edges of the U-shaped or channeled stringers 45, extending longitudinally of the evaporating-chamber the full length of the garbage-carrier, between the oppositely-located pairs of chain-wheels 35 and supported in position by transverse supporting-beams 46, arranged transversely of the evaporating-chamber between the upper and lower portions of the carrier, and having their ends embedded in the protective radiating-walls 10 at the sides of the evaporating-chamber. The transverse supporting-beams 46 are arranged at intervals and provide for the support of both of the longitudinal channel-stringers 45. It will be observed that the channel-stringers 45 not only form bearing-supports for the rollers 42, but also provide for a partial housing of these rollers.

The supporting-rollers 42 provide for maintaining the horizontal position of the upper portion of the carrier, so that the series of platform-bars at said upper side of the carrier will form a rigid slatted platform for the garbage to be delivered upon, and in order to prevent the sagging of the lower portion of the carrier below the plane of the rollers 42 longitudinal carrier-supporting beams 47 are arranged horizontally within the lower portion of the evaporating-chamber. The longitudinal supporting-beams for the lower portion of the carrier extend the full length of the latter and are supported in contact with the T-platform bars 34 of the carrier by means of suitable uprights or standards 48, arising from the floor of the evaporating-chamber.

The T-shaped formation of the platform-bars 34 not only increases the strength thereof and enables them to withstand the heat within the evaporating-chamber, but also serves another important function in connection with the use of the carrier as a garbage-supporting platform and conveyer. In this connection it is to be observed that the platform-bars 34 have flat sides or bases secured to the carrier-chains 33, thereby disposing the webs or flanges of the bars in an upward direction from the chains. By reason of this disposition it will be seen that the webs or flanges in the upper portion or run of the carrier, which portion or run constitutes the garbage-platform, form therebetween pockets which receive and hold the solid portions of the garbage, while at the same time permitting the liquid to drop

through the carrier in the manner previously explained. As the platform-bars in the upper portion or run of the carrier pass over the wheels 35 at the furnace end of the casing, or, in other words, pass from the upper run into the lower run of the carrier, the horizontal alinement of said bars is broken and the pockets formed between the bars and their webs or flanges are caused to flare outward or open up so as to freely discharge or drop the garbage. This may be plainly seen in Fig. 9 of the drawings.

The garbage which is delivered onto the garbage-carrier through the top feed-openings or manholes 3 is necessarily subjected to a separating action by reason of the slatted structure of the carriage, and the liquid matter will freely pass through the carrier onto the bottom drain floor or basin 7 and thence through the drain 9, and at the same time small particles of the garbage and refuse will at times work its way through the interstices of the carrier onto the floor 7 of the evaporating-chamber. Such portions of the garbage may be removed from the floor 7 through the side cleaning-openings 49 formed in the opposite side walls of the furnace-casing and communicating at their inner ends with the bottom portion of the evaporating-chamber 6 immediately above the plate of the floor 7. The other ends of the side cleaning-openings 49 are closed by the doors 50, but through these openings 49 accumulations of the garbage may be taken off of the floor 7 and removed to the cremating or combustion chamber 16, and if not sufficiently dried for fuel may be placed on the floor 24 of the feeding-compartment 25 until in a proper condition for burning.

While the heat and other products of combustion are mainly circulated through the side heat-flues 11 and the longitudinal passages 12 and delivered into the evaporating-chamber above the garbage-carrier therein, it is necessary at times to circulate the heat from beneath and directly through the garbage supported on the upper platform portion of the carrier, and to provide for this the protective radiating-walls 10, which form one side wall of the flues 11, are provided at intervals with supplemental circulating-openings 51, which open into the evaporating-chamber in a plane below the upper platform portion of the garbage-carrier, and these supplemental circulating-openings 51 are covered and uncovered by means of fire-clay slides 52, working within the flues 11 and through the top of the furnace-casing, said slides 52 preferably having a counterbalance connection 53 with their upper ends to facilitate the raising and lowering thereof. Adjacent to each controlling-slide 52 for the openings 51 is located a vertical fire-clay cut-off slide 54, which cut-off slide is arranged transversely of the side heat-flue 11 and has its upper end above the top of the furnace-casing attached to a counterbalance connection 55 to facilitate the rais-

ing and lowering of the same. The cut-off slides 54 extend transversely of the side heat-flues 11 the full width thereof and when lowered, as shown in Fig. 3 of the drawings, cut off the continuous circulation of the heat through the said flues. So it will be observed that by manipulating the slides 54 the free circulation of heat may be cut off from the sides of the evaporating-chamber at any point desired and caused to pass through the supplemental circulating-openings 51, as well as the longitudinal passages 12. In connection with the slides 52 and 54 it is to be understood that any pair of these slides is brought into play whenever necessary and are operated in pairs—that is, when a slide 52 is closed over the opening 51 the adjacent cut-off slide 54 is raised out of the flue 11, so as to allow a free circulation therethrough, and vice versa.

The steam, vapors, gases, and odors that arise from the garbage when undergoing evaporation within the evaporating-chamber 6 pass out of the rear end of such chamber through the escape-opening 56 and enter the lower portion of the stack 57, where the same are subjected to the consuming and deodorizing action of the scent-consumer constructed within the lower end of the stack.

The stack 57 is built at the rear end of the furnace-casing, and the base portion of the stack practically forms a part of the masonry of the casing, and said base portion of the stack, which communicates with the rear end of the evaporating-chamber 6 through the escape-opening 56, is formed with a combustion-chamber 57^a, having at the bottom thereof a pair of fire-boxes 58, in which a fire is maintained from fuel on the grates 59 or from any other source familiar to those skilled in the art, and the two fire-chambers at the lower end of the combustion-chamber 57^a are separated from each other by a partition 60, which extends the full length of the chamber 57^a and also extends to the top of the stack, thereby making a complete double chimney or stack; but said partition immediately above the plane of the fire-grates 59 terminates at one edge within the door-inclosed fire-box opening 61, communicating with both of the fire-boxes 58, thereby permitting the odoriferous gases and other products of combustion to circulate from the opening 56 into the combustion-chamber at both sides of the central vertical partition thereof.

The combustion-chamber 57^a has built within its central partition and within the side walls at opposite sides of said partition the triangularly-shaped fire-brick 62 and 62^a, the central tier of such brick 62, which is interposed in the partition 60, having at opposite sides thereof similarly-curved faces 63 and arranged with their apices in juxtaposition, while the fire-brick 62^a, lining the inner walls of the chamber 57, may be properly described as being bisections of the central brick 62 and only provided with curved faces 64 at one side. At this point it will be observed that

the tier of fire-brick 62^a at the sides of the passages through the combustion-chamber is fitted directly in and line the walls of the stack proper, thereby protecting the walls from the intense heat from the separate fires in the fire-box 58. Consequently the side tiers of fire-brick 62^a not only serve as a protective lining for the stack-walls, but also present highly-heated surfaces to provide for the deodorization of the odoriferous gases. By reason of the triangular shape of the fire-bricks 62 and 62^a the same are provided with projecting portions or points which project transversely into the separate deodorizing-passages 65, formed within the combustion-chamber 57^a, at opposite sides of the partition thereof, and the said projecting portions respectively of the central and side tiers 62 and 62^a are alternately arranged, whereby the curved faces or depressions 63 and 64 of said brick form continuous sinuously-curved deodorizing-passages through which the products of combustion and all gases must pass before they find escape into the main flue of the stack.

At the points where the fire-brick 62 and 62^a are matched together such brick are preferably arranged to leave guide slots or spaces 66, in which are mounted regulating-slides 67, which slides extend at their ends through the sides of the stack and may be operated in any suitable manner. It will be observed that the regulating-slides 67 are preferably located at the projecting portions or points of the meeting fire-brick and are adapted to be projected more or less into the deodorizing-passages 65 in order to provide means for retaining the heat within the passages 65 in the event of the draft being too rapid through the stack.

By reason of constructing the combustion-chamber 57^a with the peculiarly formed and arranged fire-brick, as described, it will be observed that the fire and heat from the fire-boxes 58 cannot skirt the said fire-brick, but are deflected laterally on account of the sinuosity of the passages from wall to wall of the latter during the passage therethrough, thereby heating the same up to the point of incandescence, so that as the odoriferous gases circuitously pass through the sinuous deodorizing-passages 65 all combustible gases will be thoroughly consumed and the other gases entirely relieved of their odor.

The construction of scent-consumer just described is designed as a distinct improvement over scent-consumers of the type disclosed in my former patent, No. 461,327. This type of scent-consumers simply involves the arrangement of a plurality of separate and disconnected fire-brick within the stack of the furnace and the arrangement of these brick preferably in a staggered relation, whereas the present invention contemplates a construction in which such an arrangement of fire-brick is entirely obviated. In the construction shown in my former patent the use

of a plurality of disconnected fire-brick is open to many objections, the principal one of which is that the comparatively-small spaces surrounding the brick very quickly become clogged with sediment and ashes that arise from the garbage. Furthermore, the disordered or staggered arrangement of the separate brick seriously interferes with the draft of the furnace and constitutes a permanent impediment in the stack. Furthermore, during the operation of the furnace the ashes and sediment will adhere to the separate bars of brick and not only render the same absolutely worthless as scent-consuming mediums, but quickly clog up the comparatively-small passages and cut off the draft of the furnace. These objections are entirely overcome by the construction of scent-consumer involved in the present application. This scent-consumer provides substantially continuous passages through which the products of combustion may freely pass without interfering with the draft, while at the same time being subjected to the highly-heated surfaces of the fire-brick, which form continuous walls for the passages.

To provide for preventing the stack from becoming too highly heated, the same has formed in opposite side walls thereof the longitudinal cold-air passages 68. These cold-air passages communicate at their lower ends at opposite sides of the combustion-chamber 67 with the air-inlet openings 69 and extend from this point the full height of the stack. A circulation of cool air is necessarily maintained in the passages 68, and thereby prevent overheating of the stack-walls, and consequently greatly adding to the durability of the stack.

In the foregoing the function of the different parts of the furnace have been fully explained; but with respect to the general operation thereof it may be stated that fires are first started in the fire-boxes 58, so as to thoroughly heat up the combustion-chamber of the scent-consumer within the stack, and the garbage, night-soil, or other wet and offensive matter is then deposited upon the garbage-carrier within the evaporating-chamber, after which a fire is made in the main cremating or combustion chamber 16. The heat and other products of combustion in the chamber 16 find escape into the evaporating-chamber through the flues and passages described and cause an evaporation of the matter on the garbage-carrier and a consequent drying thereof. When the garbage and other matter on the carrier are thoroughly dried, the carrier is moved forward in the manner explained, so as to deposit the same on the dumping-door 30. When a sufficient quantity of dry garbage has been deposited on said dumping-door, the same will overbalance the weight 34 and deliver the garbage onto the inclined floor 24 of the feeding-compartment 25, after which the opening or openings 21 are uncovered and the dry garbage fed

into the chamber 16 as fuel, and by continually feeding dried garbage in this manner into the chamber 16 a perpetual fire is maintained. In the event of the garbage delivered to the floor 24 not being sufficiently dry the said floor will complete the drying on account of its highly-heated condition, and all vapors, gases, and odors arising from any garbage on said floor 24 will pass through the draft-opening 28 into the evaporating-chamber.

An essential feature of the present invention is the provision of the protective heat-radiating walls 10. These walls, besides forming the side heat-flue 11, protect the garbage-carrier from the direct action of the fire and heat, while at the same time the said walls by reason of being made of fire-brick become heated to a high degree of heat and will act in the capacity of radiating surfaces or walls, so as to throw out heat by radiation into the evaporating-chamber 6 containing the garbage-carrier. This radiated heat, in connection with the natural circulation of hot air and other products of combustion through the flues 11 and passage 12, provide for a thorough evaporation of the garbage and the consequent drying thereof, so that the same can be used as fuel for maintaining the fire in the cremating or combustion chamber 16.

As already described, the partition 60 within the stack extends to the top of the same and forms a complete double chimney, and the combustion-chamber 57^a at the lower end of the stack is provided at opposite sides of the partition with the separate deodorizing-passages 65. The primary purpose of this double construction of stack and consuming or combustion chamber is to adapt the stack for use in connection with two furnaces, it being observed that the stack is provided directly opposite the escape-opening 56 with a corresponding opening 56^a, designed to form an escape-opening for a duplicate evaporating-chamber; but for the purposes of this invention only one evaporating chamber or furnace proper is shown, and in using this single construction of furnace the odoriferous gases and other products of combustion therefrom will pass around the lower end of the partition and circulate into both deodorizing-passages, as already explained.

In connection with each of the deodorizing-passages 65 it is to be observed that the essential feature of such construction is not the provision of fire-bricks of a triangular shape, as described, but to provide each passage with crooked or sinuous walls, so that the odoriferous gases are compelled to take a circuitous course and come in direct contact with said crooked or sinuous walls, which are highly heated before said gases can find escape into the open flue of the stack above the combustion-chamber 57^a.

It will be obvious that the shape of the fire-bricks 62 and 62^a may be varied and even dispensed with without departing from the fun-

damental feature of the scent-consumer, which is the continuous crooked or sinuous passage through which the gases are compelled to pass. In this connection it will be further observed that while a duplex construction of scent-consumer has been described and illustrated each of the deodorizing-passages 65 performs its function independently of the other, and consequently a single one of such passages 65 could be employed in a stack without departing in the slightest degree from the spirit or scope of the invention.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described furnace will be readily apparent to those skilled in the art without further description, and it will be understood that changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a garbage-furnace, the casing having an interior evaporating-chamber, and provided in its longitudinal side walls with heat-flues opening into said chamber contiguous to the crown thereof, a fire-chamber independent of the evaporating-chamber, and in direct communication with said heat-flues, and a garbage-support arranged in the evaporating-chamber below the plane of communication between the heat-flues and evaporating-chamber near the crown of the latter, substantially as set forth.

2. In a garbage-furnace, the casing having an interior evaporating-chamber, a pair of separate longitudinal heat-flues arranged respectively at opposite sides of said chamber, and extending the full length thereof, a garbage-support arranged within the evaporating-chamber between the two heat-flues, the latter having means for circulating the heated products of combustion above and below the latter, and a fire-chamber in direct communication with said flues, substantially as set forth.

3. In a garbage-furnace, the furnace-casing having an interior evaporating-chamber, separate upright interior heat-radiating surfaces independent of and spaced from the main side walls of the casing, the interval between said surfaces and the main side walls forming heat-circulating flues, means for maintaining said radiating-surfaces in a heated condition, and a garbage-support arranged between said radiating-surfaces, substantially as set forth.

4. In a garbage-furnace, the furnace-casing having an interior evaporating-chamber, and separate protective heat-radiating walls arranged longitudinally within the chamber at opposite sides thereof, said radiating-walls being independent of and spaced from the main walls of the casing, means for circulating

ing heated air and gases alongside of and over the top edges of said radiating-walls, and a garbage-support arranged between said radiating-walls, substantially as set forth.

5 5. In a garbage-furnace, a furnace-casing having an interior evaporating-chamber, and protective fire-brick radiating-walls arranged longitudinally within said chamber at opposite sides thereof, said fire-brick walls having their upper edges terminating short of the crown of the chamber to form continuous longitudinal circulating-passages, a fire-chamber having flue-openings in communication with the flues formed at one side of said radiating-walls, and a garbage-support arranged between said radiating-walls, substantially as set forth.

6. In a garbage-furnace, the furnace-casing having an interior evaporating-chamber and heat-flues extending longitudinally of the chamber at the sides thereof, said heat-flues having continuous longitudinal circulating-passages communicating with the chamber at the top sides thereof, and supplemental circulating-openings below the plane of said passages, suitable cut-off slides for controlling the circulation through said supplemental openings, and the garbage-support within said chamber, said garbage-support having its platform portion disposed in a plane between said circulating-passages and supplemental circulating-openings, substantially as set forth.

7. In a garbage-furnace, the casing having an interior evaporating-chamber, and interior walls arranged longitudinally within the chamber at opposite sides thereof to form side heat-flues, said walls having their upper edges terminating short of the crown of the chamber, and provided therein with supplemental circulating-openings, controlling-slides arranged to cover and uncover said supplemental circulating-openings, a separate cut-off slide arranged to work transversely in the heat-flues adjacent to each of said controlling-slides, and an open garbage-support having its platform portion disposed in a plane between the top edges of said walls and the supplemental circulating-openings thereof, substantially as set forth.

8. In a garbage-furnace, the casing having an interior evaporating-chamber, and side heat-flues extending longitudinally of the chamber at the sides thereof and having continuous circulating-passages communicating with the chamber at the top sides thereof, an open garbage-support arranged in said chamber, and means for directing portions of the heated products in said flues into the evaporating-chamber at points below the plane of the platform portion of the garbage-support, substantially as set forth.

9. In a garbage-furnace, the casing provided with an interior longitudinal evaporating-chamber having a single bottom discharge-opening at one end, side heat-circulating flues in communication with and dis-

posed longitudinally of said chamber, a main cremating or combustion chamber arranged below and beyond the plane of said discharge-opening, and provided at the top with a garbage-receiving heating-floor with a manhole therein, and a feeding-compartment built above the cremating or combustion chamber and partitioned from the contiguous end of the evaporating-chamber, a drop-door covering said discharge-opening and automatically operated by the weight of the garbage, and a garbage-carrier arranged longitudinally in the evaporating-chamber, substantially as set forth.

10. In a garbage-furnace, the combination of the furnace-casing having separate evaporating and cremating chambers, and a combined garbage-carrier and separating-grate supported within the evaporating-chamber, and comprising a traveling endless support, and a plurality of regularly-spaced platform-bars providing liquid-drains therebetween, said platform-bars being formed of T-shaped strips whose flat sides or bases are secured to the traveling endless support, thereby disposing their webs or flanges outward from the endless support to form therebetween garbage-pockets which open as the bars pass from the upper run into the lower run of the carrier, substantially as set forth.

11. In a garbage-furnace, the combination of the furnace-casing having separate evaporating and cremating chambers, and a combined garbage-carrier and separating-grate supported within the evaporating-chamber and comprising an endless apron formed of a plurality of regularly-spaced platform-bars providing liquid-drains therebetween, said bars being formed of T-strips, having at their ends right-angularly-disposed arms forming inclosing sides and whose flat sides or bases are fitted to the supports for the bars, thereby disposing the webs or flanges of the latter outward from the said bars, substantially as set forth.

12. In a furnace or crematory, the combination with the casing, of a stack formed with a scent-consuming chamber having a sinuous passage with continuous fire-brick walls, which walls are formed with alternate projecting portions and depressions, the projecting portions of one wall lying opposite the depressions in the opposite wall.

13. In a furnace or crematory, the combination with the casing, of the stack formed with a scent-consuming chamber having a sinuous passage with continuous fire-brick walls, provided with alternate projecting portions and depressions, the projecting portions of one wall lying opposite the depressions in the opposite wall, and one fire-brick wall of said sinuous passage being fitted in and lining a wall of the stack proper, substantially as set forth.

14. In a furnace or crematory, the combination with the casing, of the stack formed with a scent-consuming chamber having cen-

tral and side tiers of fire-brick, which brick are formed with alternate projecting portions and depressions, the side tiers of brick being fitted directly in and lining the walls of the stack proper, and the projecting portions of each tier lying opposite the depressions in the adjacent tier, substantially as set forth.

15. In a furnace or crematory, the combination with the casing, of a stack formed with a scent-consuming chamber, having a sinuous passage with continuous fire-brick walls, which walls are formed with alternate projecting portions and depressions, with the projecting portions of one wall lying opposite the depressions of the opposite wall, and regulating valves or dampers arranged at the apices of the projecting portions of said walls, substantially as set forth.

16. In a furnace or crematory, the combination with the casing, of the stack provided with a scent-consuming chamber having a central partition, and also having built within the partition, and in the walls thereof at opposite sides of the partition, approximately-triangular fire-brick having similarly-curved faces, said fire-brick being arranged in a super-

posed relation to form projecting or jutting portions, said projecting or jutting portions of the fire-brick in the partition and at the sides of the stack being disposed alternately to form sinuously-curved deodorizing-passages at both sides of the partition, and a separate fire-box arranged at the lower end of each deodorizing-passage, substantially as set forth.

17. In a furnace or crematory, the combination with the casing, of the stack provided with a scent-consuming chamber having separate continuous sinuous deodorizing-passages walled at each side with fire-brick lining having laterally-projecting portions jutting into the passages, and horizontal regulating-slides adjustably supported between the matching fire-brick at the projecting portions thereof, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

SAMUEL W. DIXON.

Witnesses:

E. D. NICKERSON,
II. MAUDE BLEAM.