

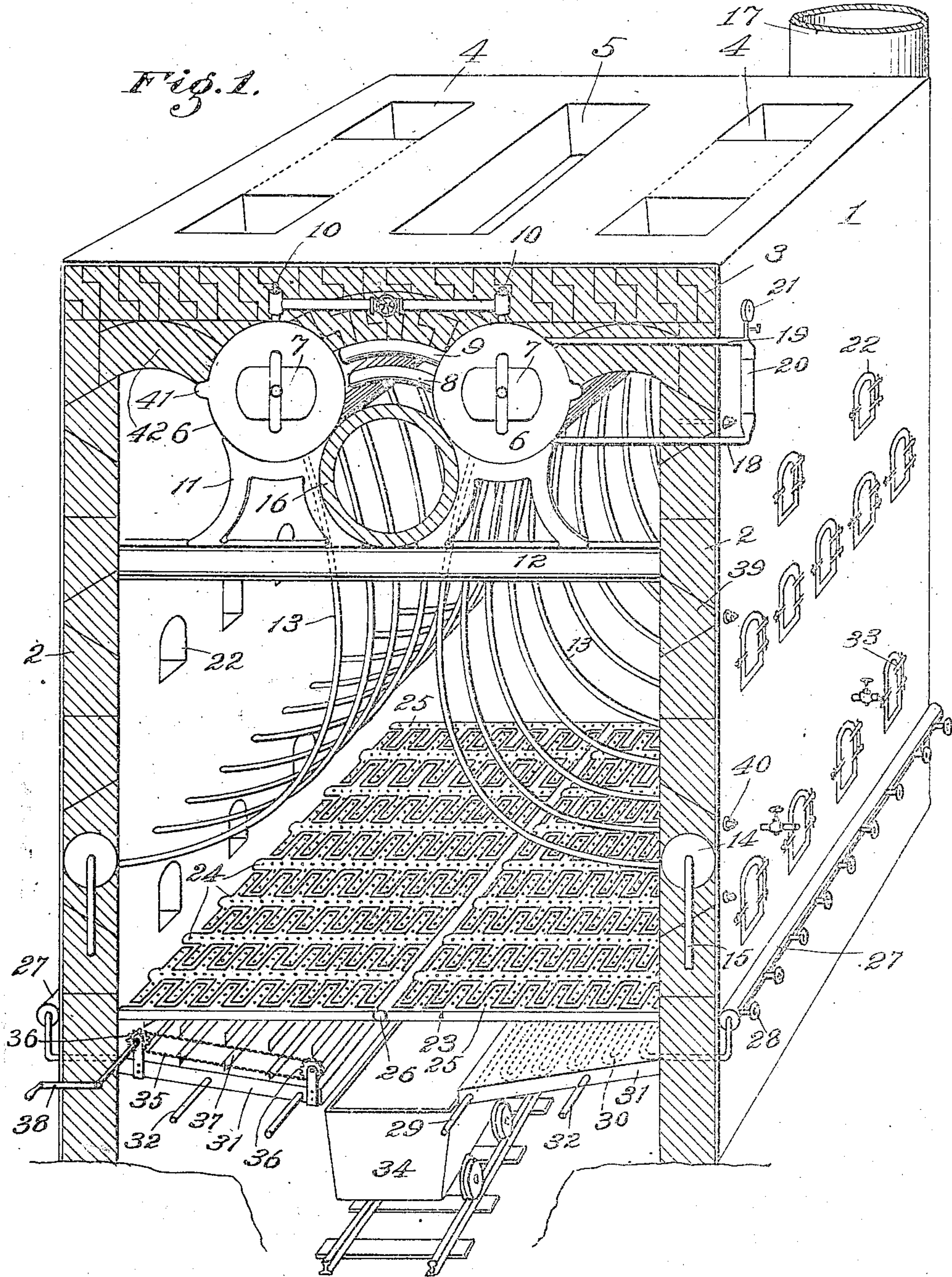
G. ALLEN.  
INCINERATOR.

APPLICATION FILED JUNE 5, 1906.

Patented Feb. 16, 1909.

912,521.

2 SHEETS—SHEET 1.



Witnesses:  
C. C. Holly  
J. Townsend

Inventor,  
Gabriel Allen.  
by James P. Townsend  
his atty



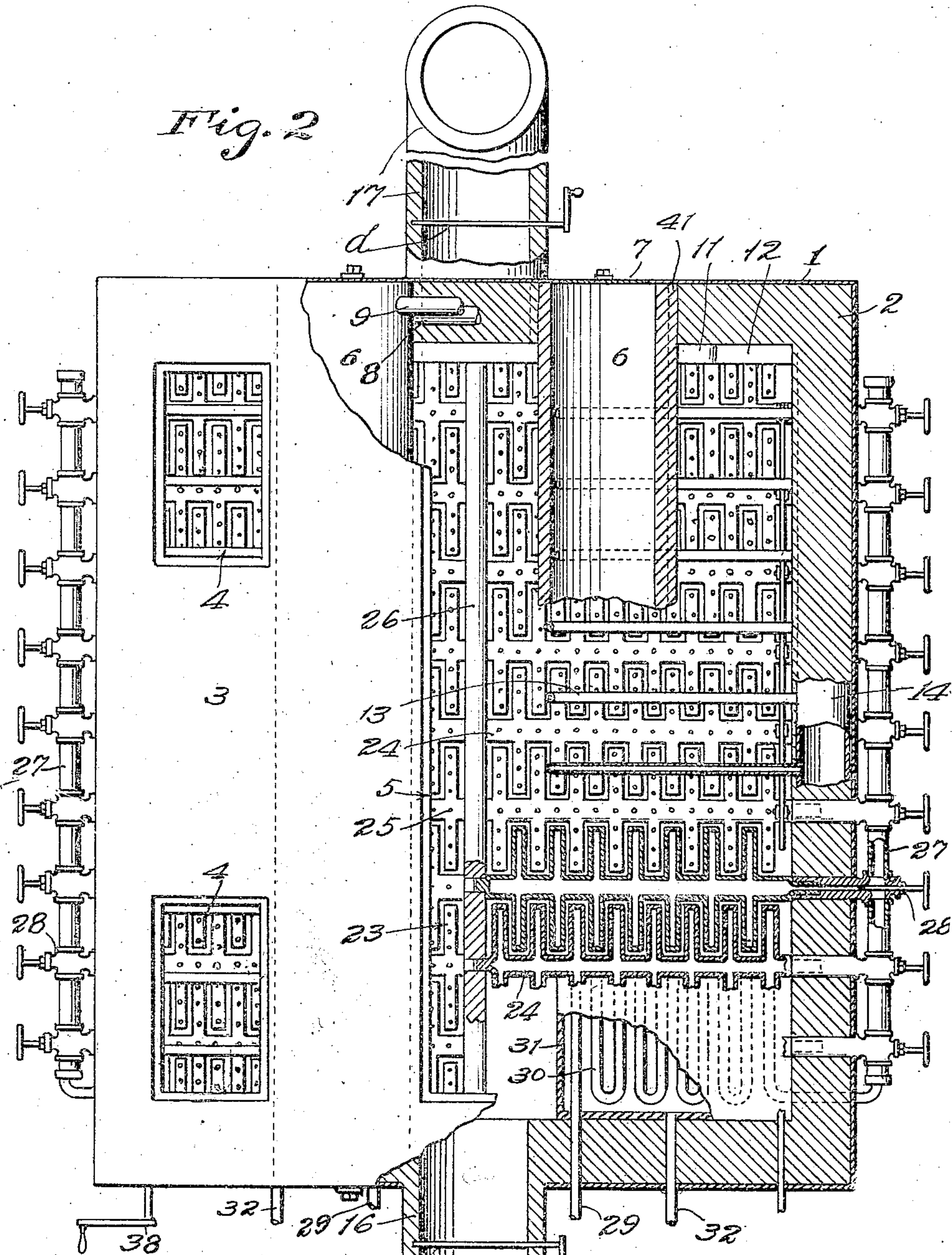
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# UNITED STATES PATENT OFFICE.

GABRIEL ALLEN, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF ONE-HALF TO TIMOTHY CARROLL, OF ANAHEIM, CALIFORNIA.

## INCINERATOR.

No. 912,521.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed June 5, 1906. Serial No. 320,295.

*To all whom it may concern:*

Be it known that I, GABRIEL ALLEN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Incinerator, of which the following is a specification.

This invention relates to furnaces, and particularly to that class of furnaces known as incinerators adapted for the destruction of refuse material.

One of the objects of this invention is to provide an improvement in incinerators designed to consume refuse material of various characters, some of which as wagon-loads of damp or wet garbage, may require one kind of treatment, and others of which materials, as loads of dry substances, as paper or other readily combustible substances, may be consumed with greater ease, while other materials as tin cans and the like may require intense heat for their destruction. The invention includes a furnace especially adapted for the treatment of these different kinds of material; provision being made for readily depositing the more combustible materials where the heat therefrom will be most effective to reduce the less combustible materials.

In carrying out this invention the top of the furnace is provided with an intermediate opening in its top and with side openings on opposite sides of the intermediate opening, each of said openings being arranged to deliver into the interior of the furnace materials dumped through said openings respectively, and there is provided in the bottom of the furnace a grate for suspending any material which may reach the bottom of the furnace and the space between the intermediate opening and such grate is open to allow material dumped through said opening to fall directly onto the grate; but underneath each of the side openings is a basket, the adjacent sides of said baskets being spaced apart from top to bottom to provide the open space below the intermediate opening through which the material dumped through said intermediate opening may fall directly to the grate, while the material dumped through either of the side openings will be caught by the basket below such opening.

By the arrangement above described the attendant is enabled to deliver to the fur-

nace in the simplest and most efficient manner and with the greatest economy of time and labor, the materials necessary to cause the most rapid incineration of the material required to be burned, the dry and combustible material being dumped into the intermediate opening while the damp, wet and more incombustible materials that require intense heat will be dumped into the side openings and thus into the baskets. In this respect I regard my present invention as a pioneer invention for the reason that the attendant is enabled to deposit the dry material with minimum labor and time, exactly where he desires to deposit it, in order to accomplish the incineration with the greatest expedition.

By dumping the readily combustible material onto the middle of the grate the combustion of the same will occur most readily at the sides of the heap of material thus dumped, for the reason that the air may flow there upward through the grates more readily owing to the smaller quantity of material on the grate at the sides of such heap, the lines of fiercest combustion are thus brought underneath the baskets containing the damper and wetter material. Provision is made in combination with the arrangement above set forth whereby the furnace may be supplied with large quantities of oxygen. This is accomplished by means of hollow and perforated grates which may be of any well known or approved form.

Another and a very important object of this invention is the provision of certain means for intensifying the heat and for continuing the fire in the cremating chamber by means of the garbage itself without the use of additional fuel. These means comprise a grate composed of a series of hollowed members having perforations upon one side whereby air is forced therethrough.

With these and other objects in view, this invention consists in the features, details of construction, and combination of parts, as will be described in connection with the accompanying drawing, and then be more particularly pointed out in the claims.

The accompanying drawings illustrate the invention.

Figure 1 is a fragmental sectional perspective view of an incinerator constructed in accordance with this invention. Fig. 2 is



a sectional plan of the same. Parts are broken away for clearness of illustration.

Specific reference being had to the same, 1 designates a metallic casing substantially rectangular and serving as a lining for the fire-brick walls 2 forming the walls of the cremating chamber. The upper wall 3 is provided with a plurality of openings 4 rectangular in shape, or round if desired, and with an elongated opening 5 forming a conveyor pit extending nearly across the entire top of the furnace. These openings or conveyor pits communicate with the interior of the crematory and are arranged to have the material to be incinerated dumped there-through. In the interior of said cremating chamber are a plurality of cylinders 6 having removable headers 7 for the purpose of allowing the same to be cleansed of any impurities. These cylinders contain water, the water level in both being equalized by the tube 8, and the equalization of the steam pressure being effected by the tube 9 connecting the two cylinders. A plurality of safety valves 10 are mounted in operative relation to said cylinders. These cylinders are carried by and mounted upon supports or standards 11, which in turn are supported by an I-beam 12 extending horizontally across the width of the furnace. Connected with the cylinders are a plurality of tubes 13 depending into the cremating chamber and extending away to the walls 2 thereof where they connect with a water-supply cylinder 14 having an inlet 15. The water in said cylinder 14 may be heated by an oil-burner or in any other manner, and as the water is heated therein it is forced through the tubes or pipes 13 upward into the cylinders 6. Upon these tubes which form substantially a basket or grate the moisture-containing product is allowed to be deposited and there held in suspension until practically all the moisture has been evaporated therefrom, the heat in the tubes contributing to this process. As will be seen from the drawing, the cylinders as well as the tubes are spaced at a predetermined distance, and the top of the oven provided with the aforementioned conveyor pit 5 for the purpose of allowing dry materials or dry products to be dumped there-through without lodging upon the baskets or tubes, but falling directly on the grate where they are consumed and reduced to ashes. 16 represents a damper-controlled flue or stack communicating with the atmosphere and the interior of the cremating chamber, which stack extends to the exterior of the furnace and away from the conveyor-pits, so that the dumping of garbage and material to be incinerated is not interfered with. Two of these stacks are provided as shown, one at 16 and one at 17, both being damper-controlled and operating to increase the circulation of the draft in the furnace and intensifying

the heat. *d* designates the dampers. Connected with said cylinders 6 are a plurality of pipes 18 and 19, the pipe 18 being connected with a water-level or indicator, and the pipe 19 being connected with a steam register 21 for indicating the pressure of steam within the upper part of the respective cylinders 6. A plurality of lateral openings 22 communicate with the interior of the baskets or grates for the purpose of dislodging the burned and dried products on to the grate below where the incineration is completed.

23 represents a fire-grate situated immediately below the depending tubes or baskets, and is composed of individual sections 24 hollow throughout and provided with a plurality of openings 25 on the top thereof. The entire grate itself is a divided grate, the line of division being shown at 26 constituting a bar into which the ends of the interacting grate members are swiveled. The opposite ends of said bars are likewise swiveled into an air reservoir 27 which carries a number of cross valves 28 designed to control the air within said reservoir. The ends of the grate bars are hollow, as well as the grate bars themselves and are swiveled to said reservoir for the purpose of allowing the same to be operated,—that is, dumped,—without interfering with the flow of air from the reservoir 27. The cross valves 28 independently control the admission of air to each individual section of the grate bars, thus admitting of the more speedy incineration of products on various parts of the grate, which fact is a decided advantage in a garbage incinerator, for the reason that when the materials are dumped into the garbage-supporting grates or baskets a considerable amount of moisture-containing material or garbage may fall through and lodge on the fire-grate below, which in ordinary cases would not be able to destroy the same, but on the other hand, the garbage would in all likelihood extinguish the fires. The air is supplied to the grates by means of an air pump whereby any degree of pressure may be attained as may be desired by the operator.

29 indicates the supply for the air reservoir 27, the pipes 30 for conducting the air to the reservoir being formed in a coil and located and inclosed within a steam jacket 31, whereby the air in its passage through said pipes is heated and reaches the grate bars in a heated condition, thus doubly intensifying the heat within the cremating chamber to consume the material upon the grate-bars.

32 shows the inlet supply for steam, the ordinary steam trap for condensed waters and the usual safety valves not being shown in the drawing. The steam jacket, as will be seen, is inclined with respect to the lateral walls of the furnace and serves, aside from



heating the air within the pipes 30, to receive the ashes from the grate-bars above, as well as to dry out any moisture which may possibly have remained in the ashes; or to receive the liquids from the garbage which may drip from the baskets or grates through the fire-grate upon said steam jacket. It is obvious, however, that on account of the intensified heat produced within the crematory by reason of the hollowed and perforated grates, the process of evaporation of any moisture which may escape from the bulk of the material; is almost instantaneous, and practical demonstration has shown that if moisture exists to such an extent that it falls in drops it is evaporated before it reaches the grate. However, as an extreme precaution, the steam jacket is provided to assist in evaporation of moisture within the furnace, but serving principally as an ash-chute for the grates above.

A plurality of lateral openings 33 are provided in the incinerator between the fire-grate and the garbage-supporting grates or baskets 13 for the purpose of removing the burned products from the fire-grates if such should remain. In operative relation to the steam jackets is a scraper operable from the outside of the furnace and designed to convey the ashes to a car 34 placed in line with the opposing steam jackets which are spaced apart and suitably supported. This scraper comprises an endless chain 35 mounted on sprockets 36, and a plurality of transversely-extending blades 37 positioned uprightly with respect to said chains and operating as they are revolved to force the ashes into the car 34 whereupon it is shoved or moved away from the furnace and another brought into place. This scraper is operated by the ordinary crank, as shown at 38. All of the grates may be operated by a single lever and bar in any usual manner, which of course dispenses with the necessity of stoking the fires through the openings 33.

The construction of the incinerator as herein represented and described, is provided with walls having a plurality of keys 39 made all of fire-brick and having an exterior metallic lining fixed thereto, as for instance, by bolts 40. This dispenses with the use of metallic steam-containing walls and insures the retention of the heat within the cremating chamber.

The equalizing means for the steam, shown at 9, serves to support the arch thereabove, although the arch is, by reason of the peculiar formation of the brick as shown, self-supporting. The cylinders have a lug or lip 41 provided on their sides for the purpose of supporting the arch 42.

In practical use the loads of refuse material may be dumped in the separate lines of openings 4 and 5 as may be judged advisable by the attendant. The dry and

readily combustible material may be dumped into the center opening 5 in great or small quantities and falling upon the fire-grates will there be consumed. While the material requiring to be dried before burning may be dumped into the baskets at the right and left of the central passage way leading downward from the middle opening or conveyor pit 5. The baskets curve upwardly from the side walls to the upper ends at the opposite sides of the passage way below the opening 5, so that the material therein is subjected to the heat of combustion of the more combustible matter on the grate-bars.

Having thus described and ascertained the nature of my invention, what I claim and desire to secure by Letters-Patent of the United States is:—

1. An incinerator comprising a casing having a chamber, a fire-grate and a plurality of baskets in the chamber, said baskets being formed of pipes and arranged to hold moisture-containing products in suspension above the grate, and being spaced apart and separate from each other with an open space between them at their tops and diverging downwardly to provide a passage-way from said open space to the fire-grate; means for supplying water to the pipes of said baskets; said casing being provided with openings arranged alongside each other above said baskets and above said passage between the baskets respectively and communicating with the chamber, part of said openings being arranged to allow moisture-containing products to fall therethrough into the baskets, and another of said openings being in the open space between the baskets to allow dry refuse to fall through said passage directly onto the fire-grate without contacting with either garbage-supporting grate.

2. In an incinerating furnace, the combination with a casing having a cremating chamber therein, of downwardly-diverging baskets separated at their tops to form therebetween a passage-way into said chamber for dry products, said casing being provided with openings to admit material into said baskets and passage-way, an opening being provided for each basket, a separate opening for the passage-way, said baskets constituting means for holding moisture-containing products in suspension on opposite sides of said passage-way, a hollow grate extending under said passage-way and baskets to receive dry material introduced into the chamber through said passage-way, and means for supplying air to said grate.

3. In an incinerator, a casing provided with a cremating chamber and openings communicating with said chamber, a plurality of grate-forming baskets beneath said openings respectively, said baskets being composed of depending tubes and arranged to hold moisture-containing products in sus-



pension and being spaced apart at their tops to form a passage-way therebetween and diverging downwardly from said passage-way, a longitudinal opening being provided  
 5 in said casing above the passage-way for the introduction of dry products into the chamber, a hollow fire-grate underneath said passage-way and baskets, means for supplying air to said hollow grate, an ash-chute below  
 10 said fire-grate, and means for heating said ash-chute.

4. An incinerator comprising a casing having a chamber within, a hollow fire-grate within the lower portion of said chamber,  
 15 means for supplying air to said fire-grate, tubular grates arranged above said fire-grate for holding moisture-containing products in suspension, said tubes having water-circulating connections and forming downwardly-diverging baskets spaced apart at  
 20 the top to afford a passage between them, means for supplying water to said tubes, flues arranged on opposite sides of the chamber and communicating with the interior thereof, a plurality of openings being provided in and communicating with the interior of the chamber from the upper portion of the casing, and arranged above the  
 25 diverging baskets and the space between said baskets respectively to allow materials of different kinds to be deposited separately in said baskets and onto said fire-grate respectively.

5. An incinerator comprising a casing having a cremating chamber within, a fire-grate, a plurality of oppositely-disposed baskets or grates composed of pipes arranged within  
 35 said cremating chamber, said baskets or grates being spaced apart at the top and diverging downwardly therefrom to provide  
 40

a passage therebetween, a plurality of openings in said casing communicating with the cremating chamber and arranged to allow material to be dumped therethrough into  
 45 the baskets, a central opening being provided in the casing and communicating with the passage between the baskets for the purpose of allowing dry material to be dumped directly between the spaced baskets onto  
 50 the fire-grate.

6. An incinerator comprising a chamber provided at the top with side and intermediate openings leading into said chamber, two downwardly-diverging baskets in said  
 55 chamber spaced apart at the top and arranged respectively below said side openings, and a fire-grate below said baskets and the intermediate space between the same; said intermediate opening being above said  
 60 intermediate space and the side openings being above the baskets respectively.

7. An incinerator comprising a chamber provided at the top with an intermediate opening and with side openings, a grate at  
 65 the lower part of the chamber and baskets arranged underneath the side openings respectively, an open space being provided between said baskets under the intermediate opening to allow dry material to be dumped  
 70 between the baskets and onto the grate for the purpose of supplying fire to burn the material held in the baskets.

In testimony whereof, I have hereunto set my hand at Los Angeles, California this 31st day of May 1906.

GABRIEL ALLEN.

In presence of—

ANTON GLOETZNER,  
 JULIA TOWNSEND.