

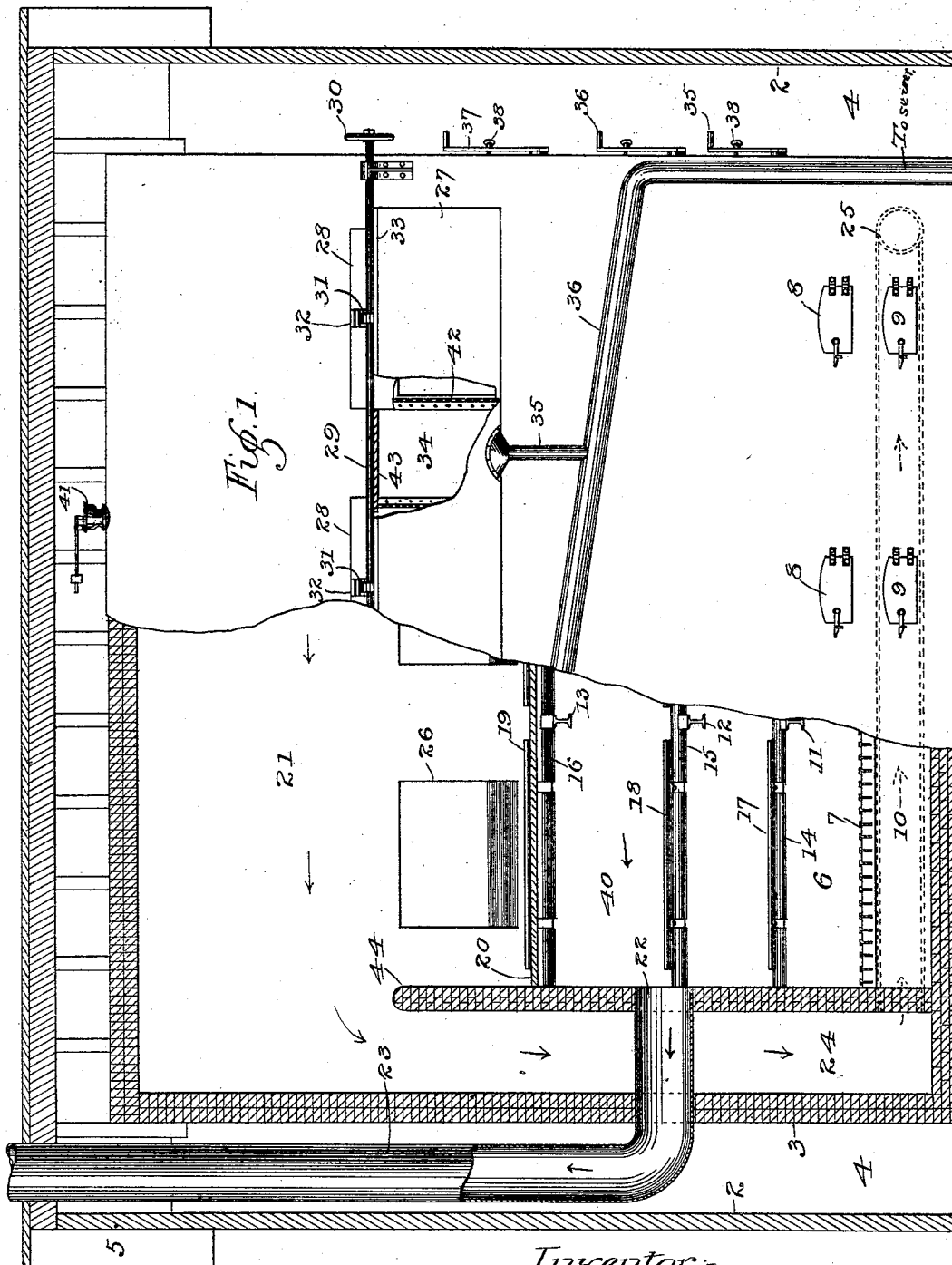
(No Model.)

2 Sheets—Sheet 1.

F. CAIN.
GARBAGE DRIER AND BURNER.

No. 484,774.

Patented Oct. 25, 1892.



Witnesses:-
C. R. Caldwell
A. M. Welch

Inventor:-
Frederick Cain,
per. Paul Murum
Attorneys.

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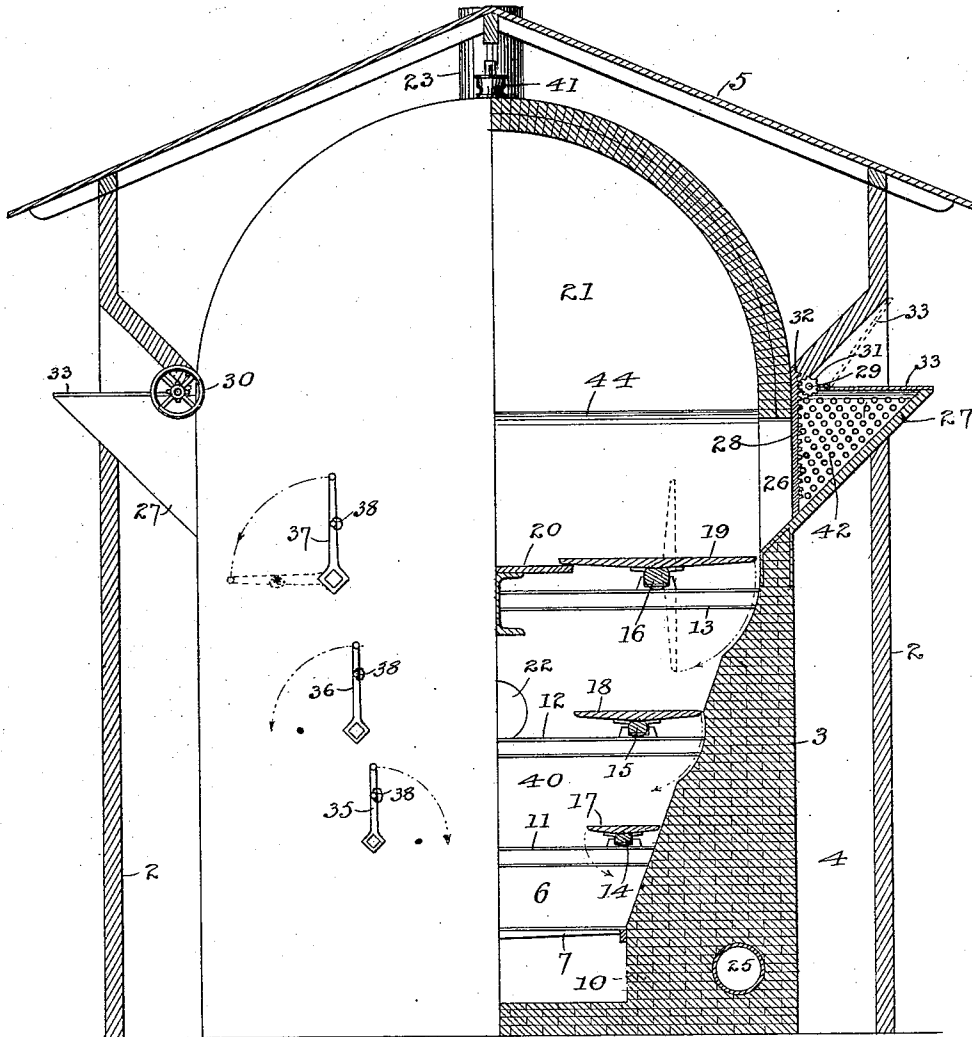


Fig. 2.

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UNITED STATES PATENT OFFICE.

FREDERICK CAIN, OF ST. PAUL, MINNESOTA.

GARBAGE DRIER AND BURNER.

SPECIFICATION forming part of Letters Patent No. 484,774, dated October 25, 1892.

Application filed November 5, 1891. Serial No. 410,957. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK CAIN, of St. Paul, Ramsey county, Minnesota, have invented certain Improvements in Garbage Driers and Burners, of which the following is a specification.

My invention relates to furnaces for the consumption of city garbage, its object being to provide a combination drier and furnace in which the garbage can be placed and first thoroughly dried and then deposited upon the fire and burned; and it consists in providing a suitable furnace and arranging above its fire-box or grate series of pivoted platforms running longitudinally of the furnace, preferably in tiers, one tier on each side of the furnace. Opening outward at or near the top of the side walls of the furnace are hoppers in which the garbage is deposited and from which it is conveyed onto the upper platforms of the tiers, these platforms being so arranged as to practically close in the entire space within the furnace-walls and separate the drying-chamber above from the combustion-chamber beneath. The ends of the hoppers are formed, preferably, of perforated sheet metal, through which the surplus water in the garbage is drained off and conducted away by suitable pipes to the sewer. The remaining moisture in the garbage is evaporated and carried off from the drying-chamber through flues running underneath and through the grate into the fire-box, so as to consume all odors and gases. When the garbage on the upper platforms is sufficiently dried, the platforms are turned on their bearings by means of cranks, thus dumping the garbage onto the platforms immediately beneath, where it is further dried, afterward being similarly dumped onto the other platforms, and thence deposited on the fire-box at the bottom.

My invention further consists in the construction and combination hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a sectional side elevation of my improved apparatus, showing the hoppers, the pipe-conductors, and the arrangement of the rotatable platforms inside the furnace; and Fig. 2 is a sectional end elevation of the same.

In the drawings, 2 represents the outer walls of the structure, which may be of any suitable material, within which are constructed the walls 3 of the furnace proper, leaving an intermediate air-space 4 for the convenient passing of attendants, the whole structure being covered by a suitable roof 5.

Access is afforded to the fire-box 6 above the grate 7 by means of suitable doors 8 for the purpose of charging the furnace with fuel, similar doors 9 being arranged beneath to give access to the ash-pit 10.

Arranged transversely of the furnace are series of iron cross bars or joists 11, 12, and 13. Upon these are journaled longitudinally of the furnace the shafts 14, 15, and 16. The shafts 14 are provided with platforms 17, and similarly the shafts 15 and 16 have platforms 18 and 19. The lower platforms in the series are preferably narrower than those above to afford space for the products of combustion in the fire-box to pass upward between them. The entire space, however, between the side walls is preferably closed in by the platforms 19 and an intermediate platform 20, forming a partition whereby the space or drying-chamber 21 above is practically shut off from the fire-box and combustion-chamber 40. The smoke and other products of combustion are carried off by means of a pipe 22, leading to the chimney or smoke-stack 23, while the moisture from the garbage upon the platforms 19 is carried off from the chamber 21 by the flues 24 and 25 through the ash-pit to the front end of the furnace, where they are discharged into the ash-pit and are carried upward through the grate-bars. By this means the foul gases and vapors from the garbage are carried through the fire before being discharged to the outer air. The inner walls of the structure are preferably formed of fire-brick and the platforms and their supports of iron.

Garbage is delivered into the apparatus and onto the top platforms 19 through openings 26, leading from hoppers 27, which project outward through the outer walls of the structure. Sliding gates or valves 28 close the openings 26. These gates are operated, preferably, by means of shafts 29, having hand-wheels 30 and provided with pinions 31, meshing into racks 32 upon the gates, so that by the

turning of the hand-wheels the gates may be raised or lowered, as desired. The hoppers are closed at the top by means of flap doors or lids 33. Between the several hoppers are the compartments 34, having perforate partition-walls 42 between them and the hoppers, through which the liquids pass from the garbage and are carried out through the pipes 35 to the conductor 36, which leads downward to the sewer, the compartments 34 being preferably covered by a lid 43. The platforms in the furnace are operated, preferably, by means of cranks 35, 36, and 37, which are secured so as to hold the platforms in proper position by means of pins 38, inserted through the cranks into the wall of the structure, thus holding the platforms from being turned. In order to prevent danger of explosion from the gases generated in the drying-chamber, a safety-valve 41 may be provided in the top of the drying-chamber, so as to afford the necessary outlet.

Operation: The platforms are placed and locked in a horizontal position, as shown by the full lines in the drawings, and a fire kindled in the fire-box. The lids 33 of the hoppers are opened to receive the garbage, the gates being closed, so that it is held in the hoppers until the surplus moisture has been drained off through the strainers 34 and pipes 35 and 36. The gates 28 are then raised by turning the hand-wheels 30 and the garbage discharged onto the top platforms 19. The heat from the fire below causes the moisture in the garbage to be evaporated and carried off through the flues 24 and 25 and upward again through the burning fuel, thence passing off with the smoke and other products of combustion through the pipes 22. The garbage having been partially dried, the handles 37 are unfastened and turned downward into the position shown by the dotted lines, thus causing the platforms to be turned on their shafts and to dump the contents upon the platforms 18 below, where they are further dried and afterward similarly dumped onto the platforms 17, and thence onto the fire beneath, the platforms 17 turning, preferably, inward, so as to carry the contents onto the middle of the grate.

I claim—

1. In a device of the class described, the combination, with the furnace, of the closed horizontal partition arranged above its fire-box and forming a combustion-chamber beneath and a drying-chamber above, dumping-platforms arranged in and forming part of said partition, means for conveying garbage onto said platforms, and other dumping-platforms arranged in the combustion-chamber, adapted to receive the material from the first platforms and to hold it in contact with the

products of combustion and to deliver it directly upon the grate, substantially as described.

2. In a device of the class described, the combination, with the furnace, of the horizontal dumping-platforms arranged above the fire-box and constituting a closed partition, thereby forming a combustion-chamber beneath and a drying-chamber above, each of said chambers being provided with suitable outlets for the gases, and a series of smaller dumping-platforms arranged in the combustion-chamber beneath said first platforms, substantially as described.

3. In a device of the class described, the combination, with the furnace, of the horizontal dumping-platforms arranged therein above the fire-box and forming a partition, the space beneath serving as a combustion-chamber and the space above as a drying-chamber, the hoppers upon the outer walls of said furnace adapted to receive garbage, means in said hoppers for draining liquids from said garbage, means for conveying said garbage from the hoppers onto said dumping-platforms, the series of successively-smaller dumping-platforms arranged in the combustion-chamber beneath said first platforms, and means for operating said platforms, substantially as described.

4. The combination, with the furnace, of the hoppers in the side walls thereof, gates for closing the outlets of said hoppers to the furnace, strainers in said hoppers and their pipes for drawing off the liquids from said hoppers, the partition between the drying and combustion chambers of said furnace, dumping-platforms in said partition, similar platforms beneath said first platforms, and flues connecting said drying-chamber with said combustion-chamber through the fire-box, substantially as described.

5. In a furnace, the combination of the fire-box and combustion-chamber communicating with the smoke-pipe, the drying-chamber above said combustion-chamber communicating with the combustion-chamber through the fire-box, dumping-platforms arranged in the partition between the chambers, means for conveying garbage onto said platforms, similar smaller dumping-platforms arranged in the combustion-chamber beneath said first platforms, and means for operating said platforms and for securing them in their normal position, substantially as described.

In testimony whereof I have hereunto set my hand this 21st day of October, 1891.

FREDERICK CAIN.

In presence of—

T. D. MERWIN,
A. M. WELCH.