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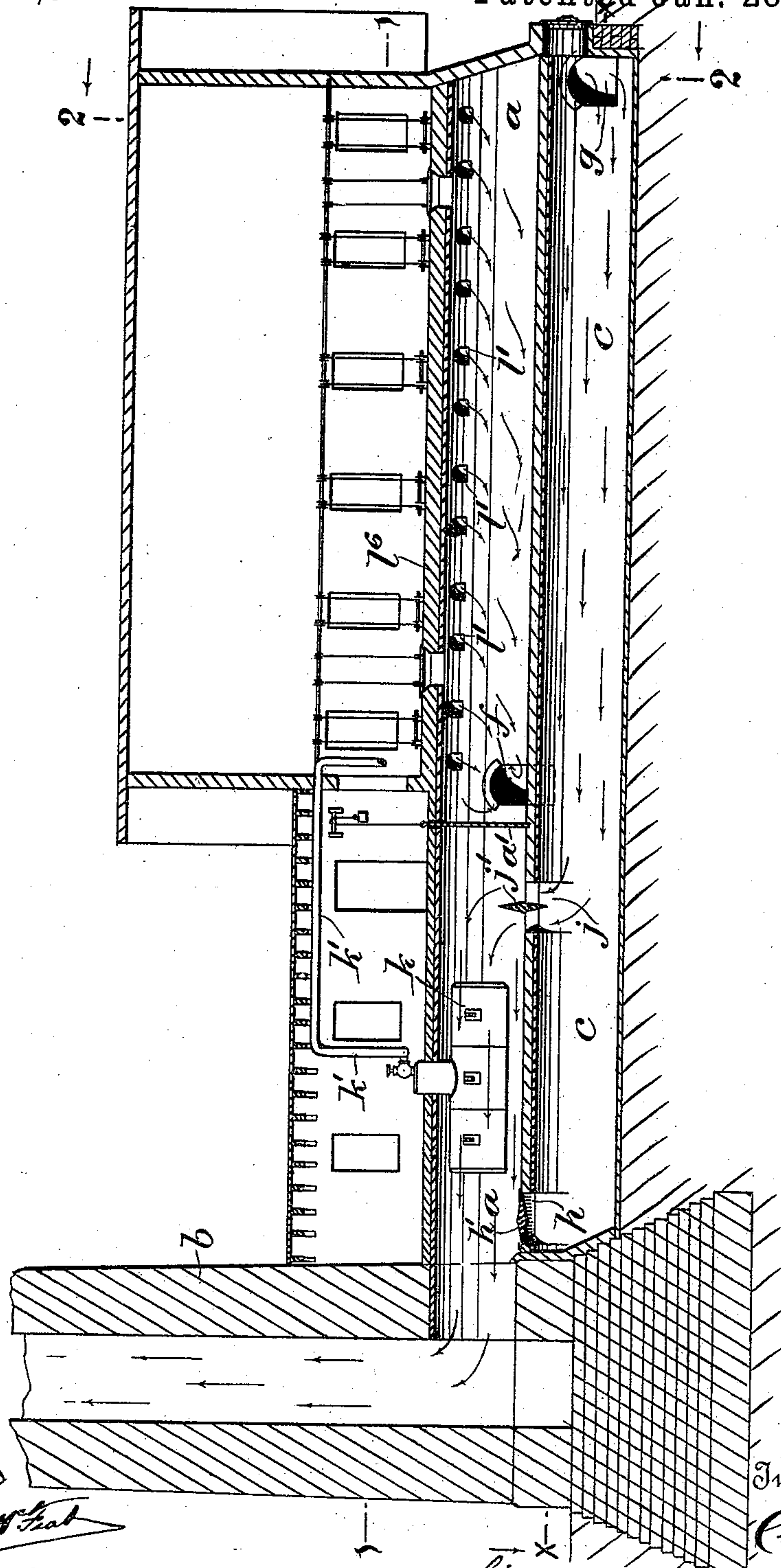
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C. THACKERAY.
INCINERATOR.

No. 553,574.

Patented Jan. 28, 1896.

Fig. 1—



Witnesses
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Inventor
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By his Attorney
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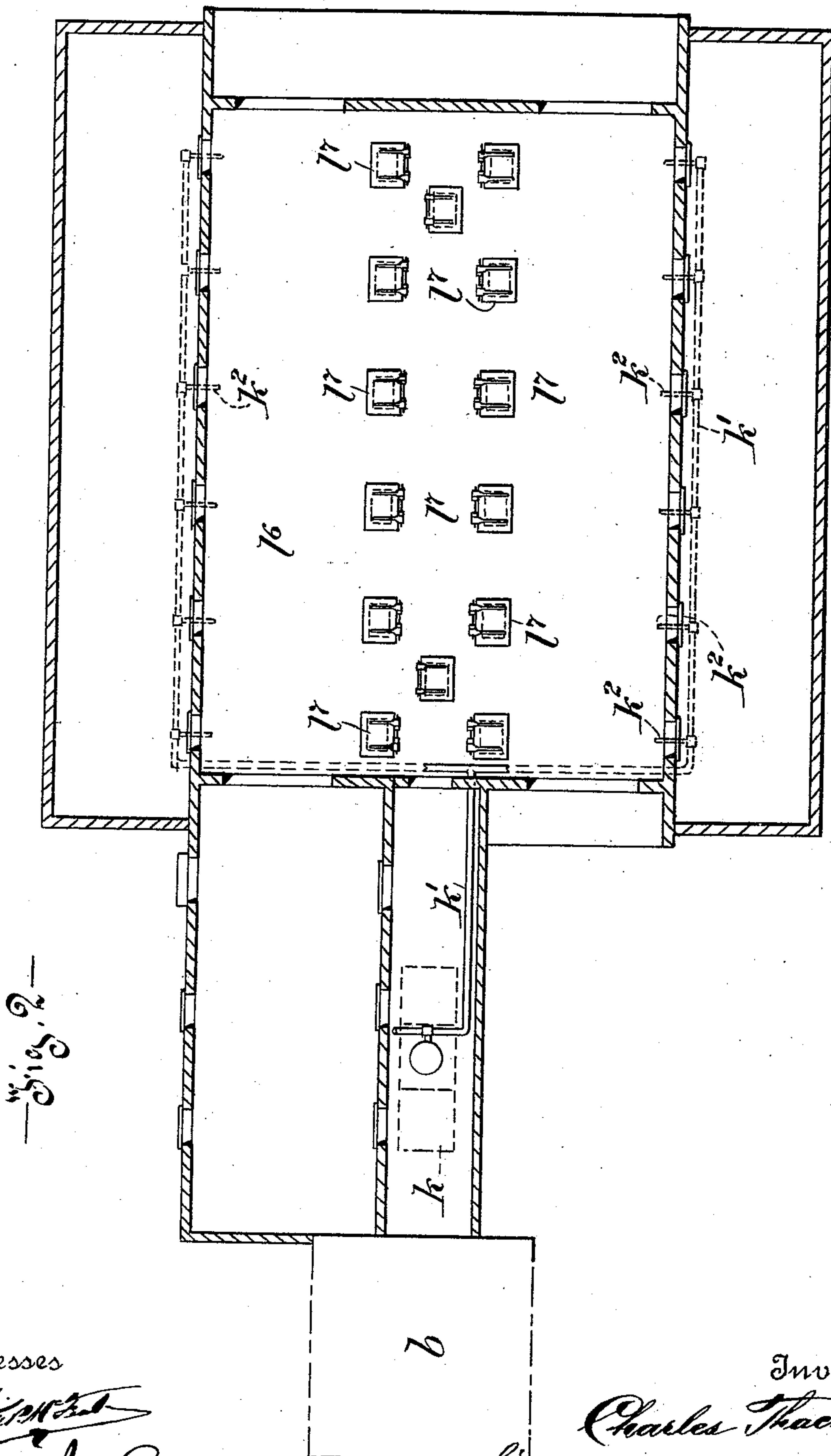
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Patented Jan. 28, 1896.



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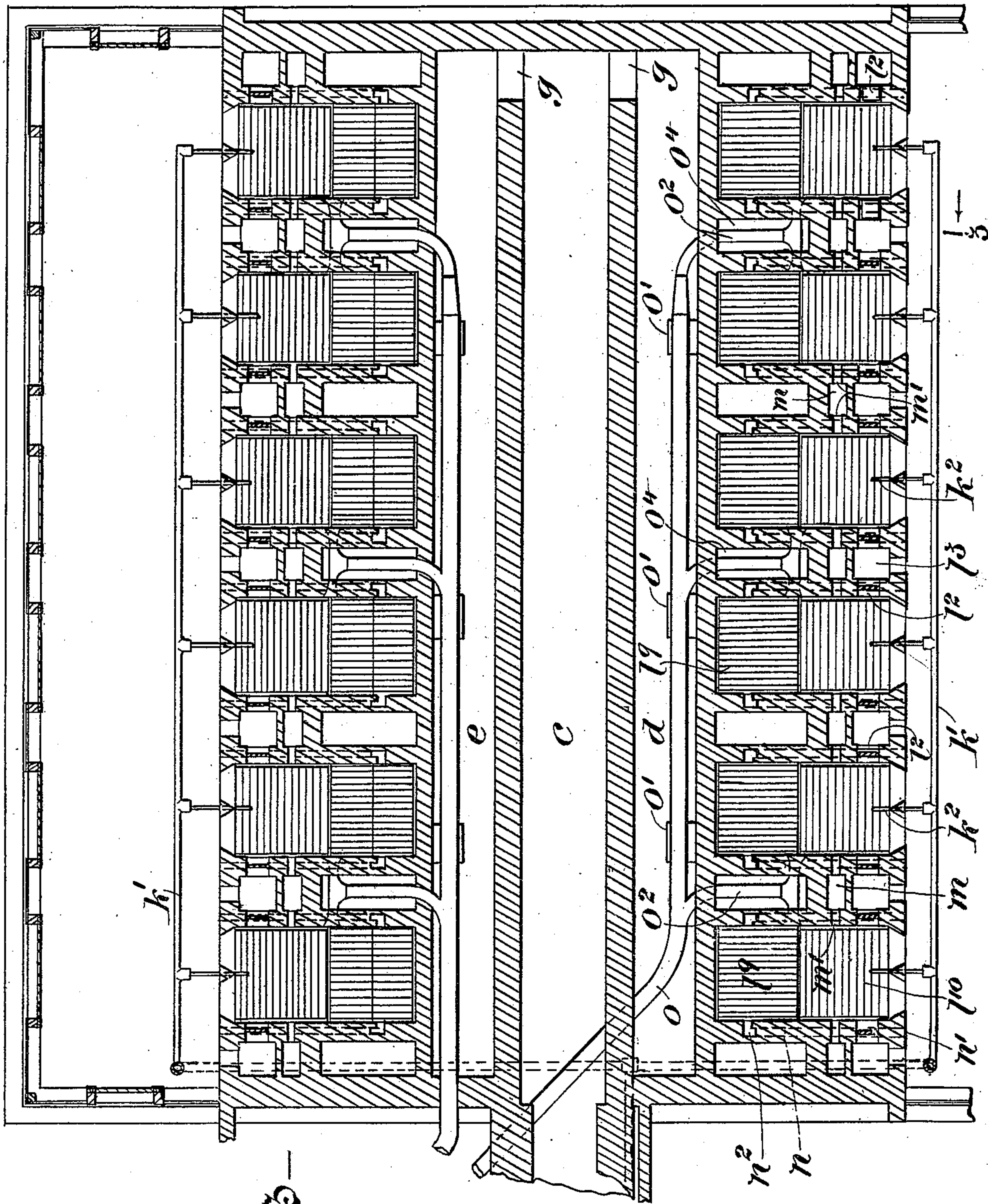
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Fig. 2

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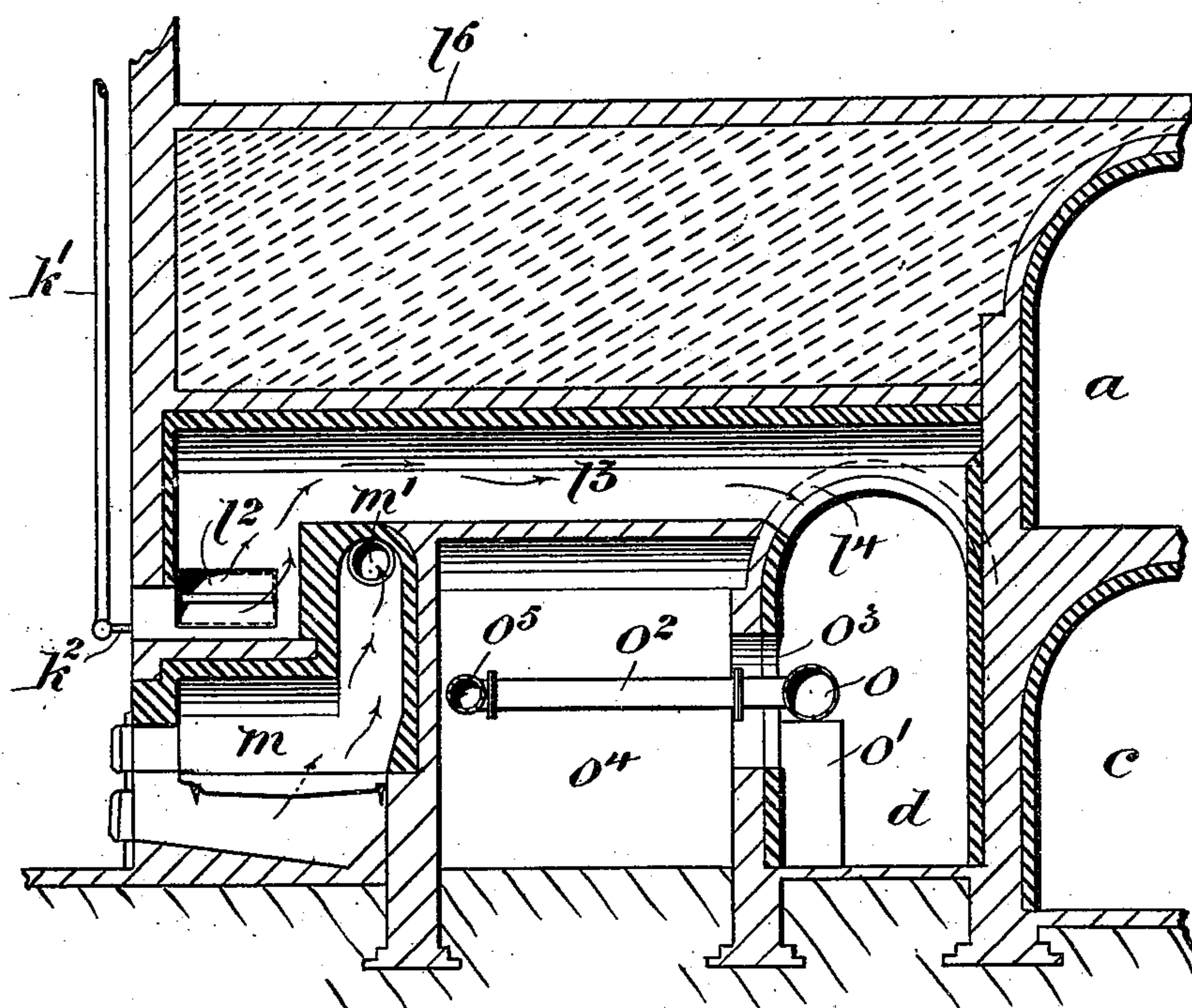
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No. 553,574.

Patented Jan. 28, 1896.

— Sig. 4 —



Witnesses

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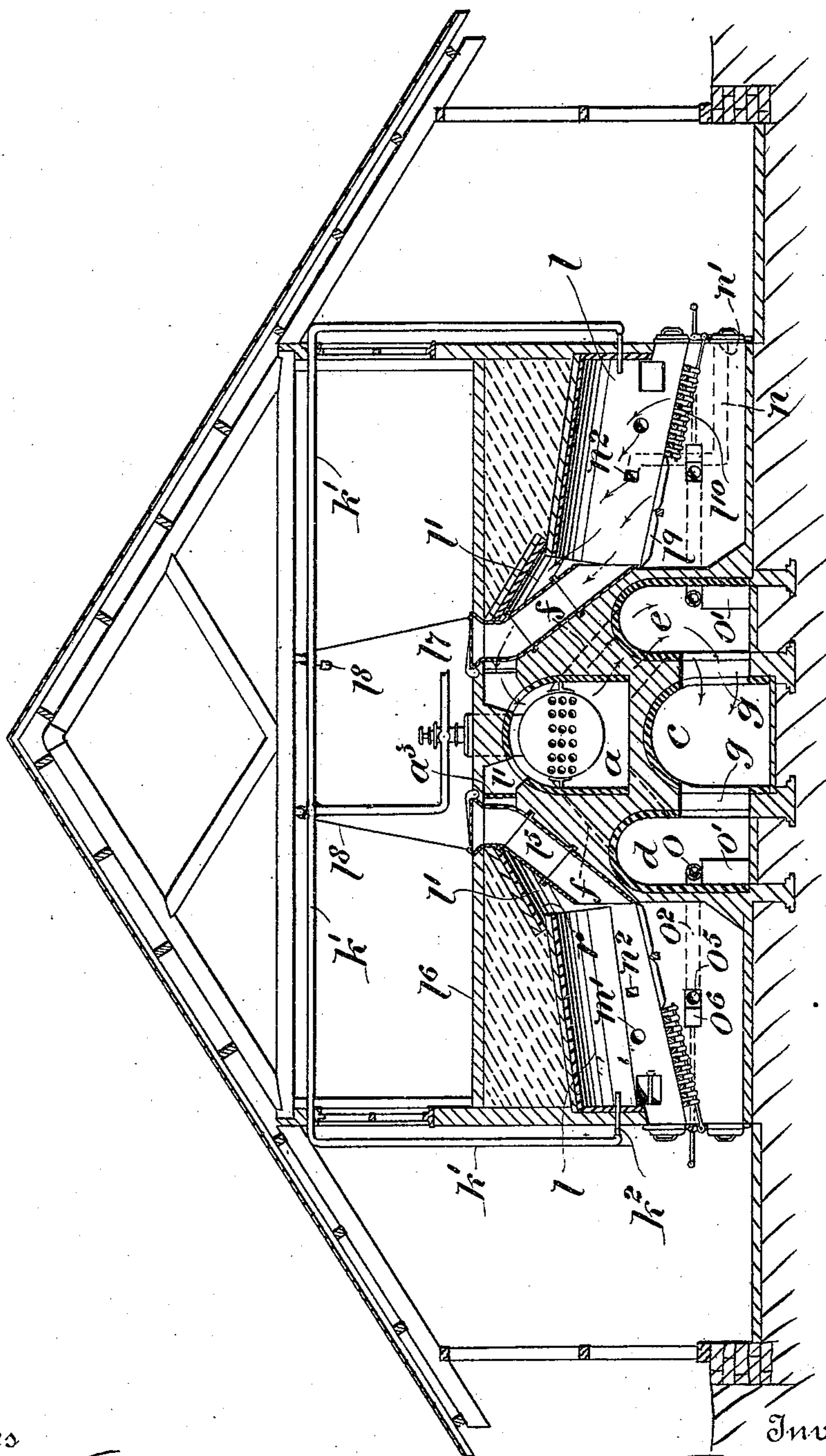
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C. THACKERAY.
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Patented Jan. 28, 1896.



—Fig. 5—

Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES THACKERAY, OF MONTREAL, CANADA.

INCINERATOR.

SPECIFICATION forming part of Letters Patent No. 553,574, dated January 28, 1896.

Application filed July 30, 1894. Serial No. 518,949. (No model.)

To all whom it may concern:

Be it known that I, CHARLES THACKERAY, of the city of Montreal, in the district of Montreal and Province of Quebec, Canada, have invented certain new and useful Improvements in Incinerators; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to structures wherein garbage and general refuse are consumed, and has for its object to secure improvements both as concerns the rapid and complete consumption of the garbage itself and the products of combustion more or less, as well as in the killing of the microbes and the destruction of the septic poisons contained in the garbage to prevent their passing out of the incinerator again, and furthermore the arrangement is such that a very large horsepower of mechanical energy, in the form of superheated steam, can be derived from the apparatus.

By my invention, also, a complete control of the products of combustion is secured, with resultant advantages in the operation of the incinerator.

The invention consists in the several arrangements and combinations of parts hereinafter described and pointed out in the claims, and for full comprehension thereof reference must be had to the annexed drawings, forming a part of this specification, in which like symbols indicate corresponding parts, and wherein—

Figure 1 is a longitudinal vertical section throughout the incinerator proper, chimney, and covering or roof; Fig. 2, a horizontal section on line 1 1, Fig. 1, looking in the direction indicated; Fig. 3, an enlarged horizontal section of the incinerator proper on line xx , Fig. 1, looking in the direction indicated; Fig. 4, an enlarged detail vertical sectional view taken on line 3 and looking in the direction indicated in Fig. 3, showing one of the auxiliary cells and the connection of one of the main cells with one of the auxiliary flues. Fig. 5 is a transverse vertical section of the incinerator proper, taken on line 2 2, Fig. 1.

The incinerator is constructed to secure a variable system of circulation or alternative circuits for the products of combustion

whereby they may be directed either by a short way to the chimney or have the extent of their travel lengthened for the purpose of subjecting the products to prolonged action of the heat, and to this end I prefer to build a main horizontal flue a , extending throughout the full length of the incinerator to the chimney b , and provided with a vertically-sliding damper a' having suitable means for raising and lowering it, and three parallel auxiliary flues c , d and e , the one c being situated beneath the main flue a and of a like length, while those, d and e , are situated along the sides of the flue c , but are shorter in length than such flue.

The ends of the auxiliary flues d e nearest the chimney are in communication with the main flue through openings f f , and at their opposite ends with the central auxiliary flue c by openings g g , while openings h and j , respectively, furnished with dampers h' j' , are arranged between the flue c and main flue a , the opening h being near the chimney and the opening j at a point near the openings f , but between them and the opening h , and sufficiently far from the latter to leave space for a boiler k , which I prefer to use for purposes to be presently mentioned.

Along each side of the incinerator contiguous to the auxiliary flues d and e is arranged a series of furnaces or consuming-cells preferably composed of main cells l and auxiliary cells m in alternate order, the main cells communicating through flues l' directly with the main flue a , and the auxiliary cells communicating with the main cells on each side through openings m' in the dividing walls between them. The main cells can also have communication with the auxiliary flues d e through damper-controlled openings l^2 and passages or spaces l^3 above the tops of the auxiliary cells and leading to openings l^4 in the tops of such auxiliary flues; but in this case it is necessary to close the dampers a^3 situated in the flues l' .

The use of separate auxiliary cells in which all the more inflammable matter can be burned secures a better consumption of the less inflammable garbage placed in the main cells as the hot gases and products are taken into the main cells to assist their fire and gases.

The main cells are supplied through chutes

located in the connecting-flues l' between such main cells and the main flue a , such chutes being of less width than the flues, and their upper ends are in hopper form and fitted in openings in an upper flooring or platform l^6 , covering the incinerator proper. The chutes are closed by suitable hinged covers l^7 , preferably provided with counterbalance lifting devices l^8 , and being situated as they are in the hottest flues the fresh garbage is subjected to intense heat and considerably dried before reaching the furnace, the elongation of the chute being also conducive to a retardation to some extent of the travel of the garbage through it.

The auxiliary cells are supplied similarly to any ordinary furnaces through the fire-doors thereof.

I have shown the main cells as provided with fire-grates composed in part of stationary bars l^9 and rocking bars l^{10} , the latter constructed and operating as set forth in an application for United States Patent filed July 5, 1894, under Serial No. 516,679, which arrangements allow of the most garbage entering the combustion-chamber being detained for a short time upon the stationary grate portion before reaching the rocking grate portion, thus securing the complete drying thereof, avoid any necessity for opening the furnace-doors for clinkering purposes, and consequently prevent the escape of foul odors and gases.

It will be noticed that the flues l' between the main cells and the main flue a are wider at the end adjoining the cell than at its opposite end, this being for the purpose of providing a space or chamber r where an accumulation of hot gases will take place, and also where such gases will be free to expand so that as the fresh garbage is fed in these gases (intensified in heat by their expansion) are drawn down through the garbage, thus drying it very rapidly and so facilitating its combustion.

To assist the combustion in the main cells, I arrange for the introduction of quantities of air in a natural way (as by the suction caused by the draft of the chimney) through flues n formed in each dividing-wall between the auxiliary and main cells, such flues leading from openings n' in the sides of the incinerator inward and upward to openings n^2 in the walls at a point above the rear portion of the fire-grates of the main cells, as shown in Fig. 5.

It is also found desirable at times to use an air-blast to assist the consumption in the main cells, and for this purpose main lengths o of piping, extending from any suitable pumping or blowing apparatus, (not shown,) are laid upon supports o' in the auxiliary flues $d e$, and have branches o^2 passing through openings o^3 in the sides of the flues into chambers o^4 in rear of the auxiliary cells, the ends of the branches terminating in T-sections, so as

to communicate with the main cells on each side of the chambers o^4 through inlets o^5 in the side walls of the cells, preferably controlled by sliding dampers o^6 operated from the outside of the incinerator.

In order to provide a supply of superheated steam for use in killing the microbes and destroying the septic poisons contained in the garbage I use the boiler k , before mentioned, located in the main flue a near the chimney beyond the damper a' and between the damper-controlled openings h and j from the flue c , so that should it be desired to cut off such boiler at any time the dampers a' and j' would be closed, thus compelling the hot gases to pass through the openings $f f$ to and through auxiliary flues $d e$ and openings $g g$, auxiliary flue c and damper-controlled opening h to the chimney instead of through the flue a and the tubes of the boiler. The supply of superheated steam derived from the boiler k is distributed by a system of pipes k' to each main cell, entering them through branch nozzles k^2 from the front at a point over the fire-grate. As it is only necessary to introduce the superheated steam into the furnace when the garbage is first introduced this supply, as well as any superfluous amount, can be utilized for the running of electrical or other plants, thus affording a source of revenue tending to offset to a considerable extent the cost of operating the incinerator.

What I claim is as follows:

1. An incinerator having a main flue for the products of combustion; auxiliary flues running parallel thereto; suitably controlled communicating passages between the main and auxiliary flues; series of furnaces and combustion chambers laterally adjoining the auxiliary flues; main transverse communicating passages, suitably controlled, between said combustion chambers and the main flue; and auxiliary transverse communicating passages, suitably controlled, between said combustion chambers and said auxiliary flues, for the purpose set forth.

2. An incinerator having a main flue for the products of combustion, a series of main furnaces and combustion chambers laterally adjoining said flue; suitably controlled main and auxiliary transverse communicating passages between the combustion chambers and said flue, and a series of auxiliary furnaces or cells communicating with said main cells, for the purpose set forth.

3. An incinerator having a main flue for the products of combustion; a series of main furnaces and combustion chambers laterally adjoining said flue; suitably controlled transverse communicating passages between the combustion chambers and said flue; and a series of auxiliary cells arranged in alternate order with said main furnaces and communicating on each side with same, for the purpose set forth.

4. An incinerator having a ground floor and

an upper floor, a main horizontal flue, for the products of combustion; one or more furnaces and combustion chambers laterally adjoining said flue, to receive the garbage; a suitably controlled inclined and elongated transverse communicating passage or passages for the products of combustion extending between the combustion chamber and said flue and presenting an inclined bearing surface, and an inclined garbage receiver or chute located in said transverse passage or passages, supported upon said bearing surface, and having its receiving end flush with the upper floor for the purpose set forth.

5. In an incinerator having one or more furnaces to receive the garbage and communicating with a tapering flue leading to the chimney thereof, a garbage receiver or chute located in the tapering flue, through which the products of combustion pass, and being elongated and of a less sectional area than said flue and with its receiving end located in the narrow end of the flue and its delivery end in the wider end thereof for the purpose set forth.

6. In an incinerator having a main flue and one or more furnaces to receive the garbage and a tapering communicating passage leading from such furnace to the main flue for the passage of the products of combustion therefrom, said communicating passage being larger at its end adjoining said furnace than at its opposite end and having its roof out of line above that of the furnace to form a chamber *r*, and a garbage receiver or chute located in said tapering communicating passage, for the purpose set forth.

7. In an incinerator having one or more furnaces to receive the garbage and a tapering flue leading from such furnace for the passage of the products of combustion therefrom, said flue being larger at its end adjoining said furnace than at its opposite end and having its roof out of line above that of the furnace to form a chamber *r*, and a garbage receiver or chute located in said flue and being of a less sectional area than said flue, for the purpose set forth.

8. An incinerator having a main horizontal flue, for the products of combustion, a chimney located at one end of same, a central auxiliary flue and outer auxiliary flues running parallel with the main flue; suitably controlled communicating passages between said central auxiliary flue and main flue; series of furnaces and combustion chambers laterally adjoining the outer auxiliary flues; main transverse communicating passages, suitably controlled, between said combustion chambers and the main flue; auxiliary transverse communicating passages, suitably controlled, between said combustion chambers and said auxiliary flues; and series of auxiliary furnaces or cells arranged in alternate order with

said main furnaces and communicating on each side with same, for the purpose set forth.

9. An incinerator having a main horizontal flue for the products of combustion, a chimney located at one end of same, a central auxiliary flue and outer auxiliary flues running parallel with the main flue; suitably controlled communicating passages between said central auxiliary flue and main flue; series of furnaces and combustion chambers laterally adjoining the outer auxiliary flues; main transverse communicating passages, suitably controlled, between said combustion chambers and the main flue; auxiliary transverse communicating passages, suitably controlled, between said combustion chambers and said auxiliary flues; series of auxiliary furnaces or cells arranged in alternate order with said main furnaces and communicating on each side with same; and suitable conductors arranged in said flues for conveying a blast to the interiors of such furnaces as and for the purposes set forth.

10. An incinerator having a main horizontal flue for the products of combustion; a chimney located at one end of same; a central auxiliary flue and outer auxiliary flues running parallel with the main flue; suitably controlled communicating passages between said central auxiliary flue and main flue; series of furnaces and combustion chambers laterally adjoining the outer auxiliary flues; main transverse communicating passages, suitably controlled, between said combustion chambers and the main flue; auxiliary transverse communicating passages, suitably controlled, between said combustion chambers and said auxiliary flues; series of auxiliary furnaces or cells arranged in alternate order with said main furnaces and communicating on each side with same; a steam boiler located in said main flue and suitable conductors connected with said boiler and serving to convey superheated steam to said furnaces or cells, for the purposes set forth.

11. An incinerator having a main horizontal flue for the products of combustion; a chimney located at one end of same, an auxiliary flue running parallel with and beneath the main flue, series of furnaces and combustion chambers laterally adjoining the flues and in communication therewith; suitably controlled communicating passages between said auxiliary flue and main flue, and a damper for controlling the latter and a steam boiler located in said main flue intermediate of said damper and the chimney for the purpose set forth.

Montreal, 13th day of July, 1894.

CHARLES THACKERAY.

In presence of—

WILL P. McFEAT,
FRED. J. SEARS.