

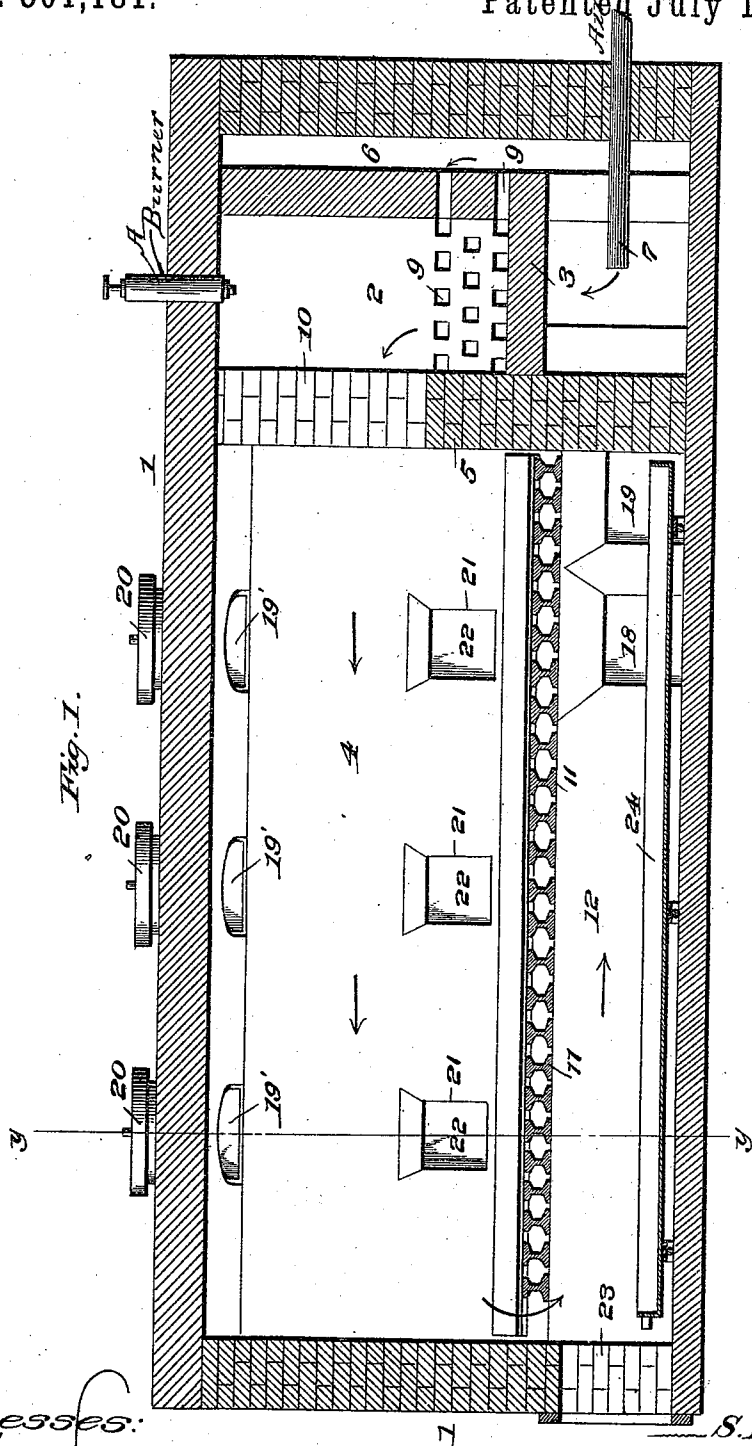
(No Model.)

3 Sheets—Sheet 1.

S. H. BROWN.
FURNACE FOR BURNING GARBAGE.

No. 501,181.

Patented July 11, 1893.



Witnesses:

W. E. Sullivan
Thos. F. Gatchell

S. H. Brown
Inventor:

by
W. D. Shackbridge & Son.
Attorneys.

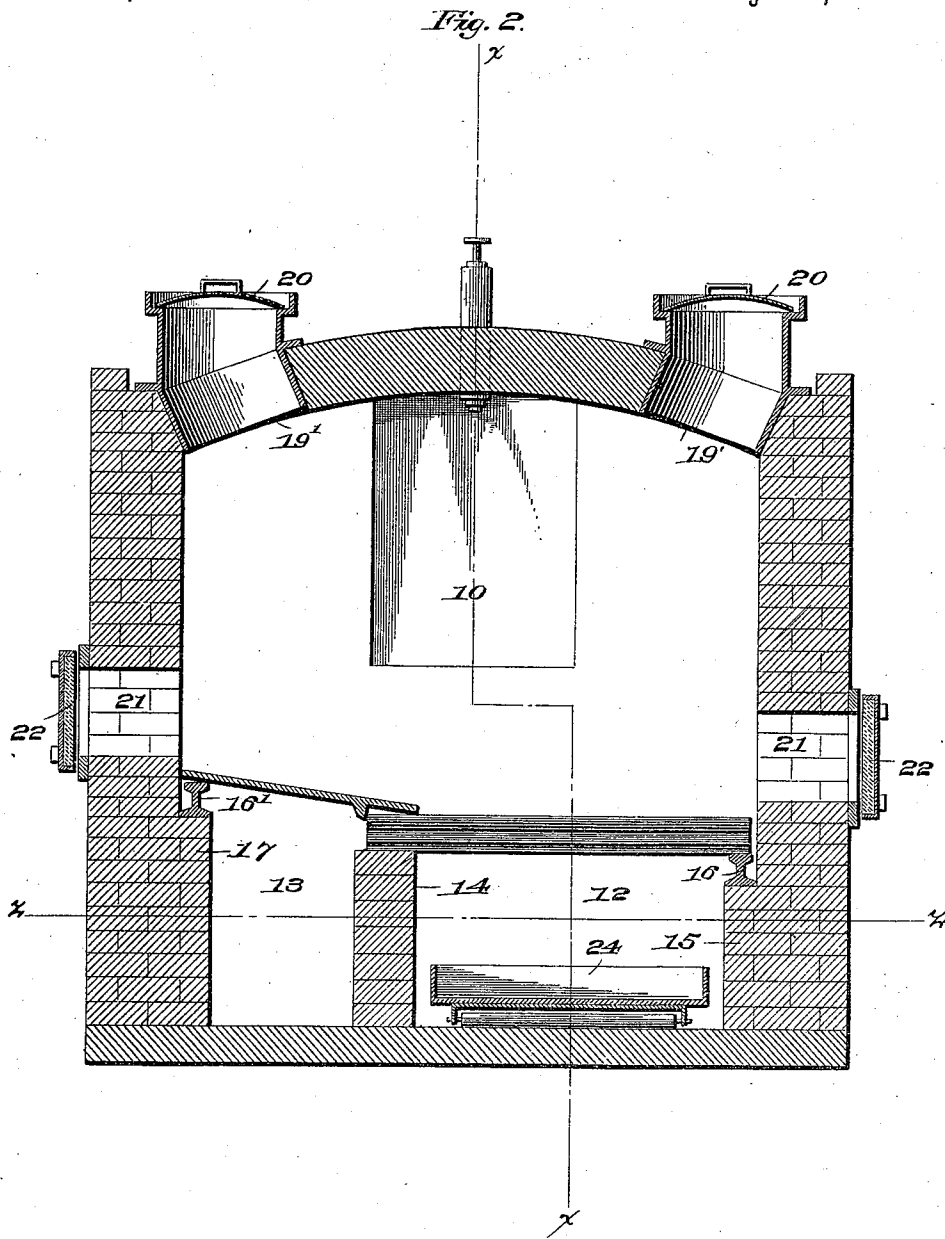
(No Model.)

3 Sheets—Sheet 2.

S. H. BROWN.
FURNACE FOR BURNING GARBAGE.

No. 501,181.

Patented July 11, 1893.



Witnesses:

Wm. C. Shill
Thos. L. Gatchel

S. H. Brown.
Inventor:

by
V. D. Stockbridge & Son.
Attorneys.

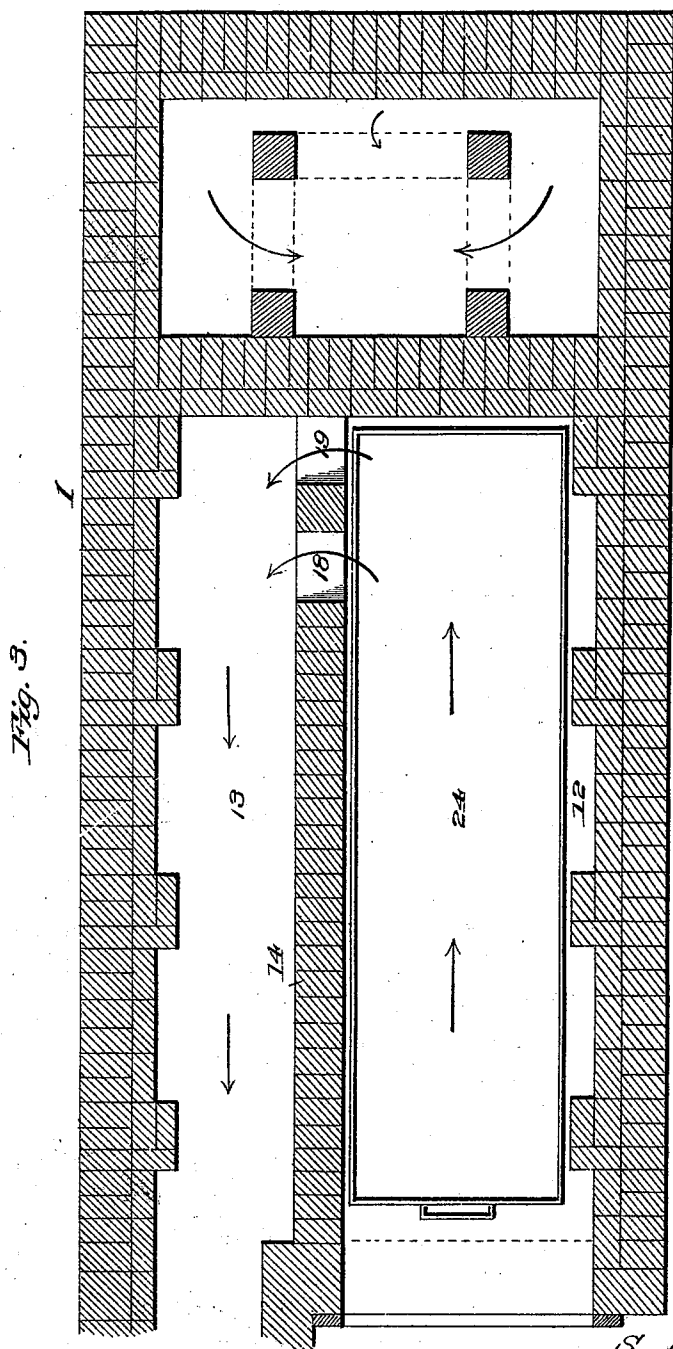
(No Model.)

3 Sheets—Sheet 3.

S. H. BROWN.
FURNACE FOR BURNING GARBAGE.

No. 501,181.

Patented July 11, 1893.



Witnesses:

Wm. C. Ashill
Thos. L. Hatch

S. H. Brown.
Inventor:

by *V. D. Shackbridge & Son*
Attorneys

UNITED STATES PATENT OFFICE.

SAMUEL H. BROWN, OF BELLEVILLE, NEW JERSEY, ASSIGNOR TO THE
BROWN DEVELOPING COMPANY, OF NEW JERSEY.

FURNACE FOR BURNING GARBAGE.

SPECIFICATION forming part of Letters Patent No. 501,181, dated July 11, 1893.

Application filed February 21, 1893. Serial No. 463,277. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL H. BROWN, a citizen of the United States, residing at Belleville, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Furnaces for Burning Garbage; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in furnaces for cremating garbage, and is designed to produce a furnace wherein all gases and vapors generated in initially heating the garbage and in the combustion and final treatment of the same will be thoroughly and effectually decomposed before passing from the furnace, and by means of which the liquid portions of the garbage, which contain a valuable percentage of fatty fuel, may be utilized, as more fully hereinafter explained. These objects are accomplished by the means illustrated in the accompanying drawings, in which—

Figure 1, represents a longitudinal, vertical, sectional view, through the line $x-x$ of Fig. 2, of a furnace constructed according to my invention. Fig. 2, represents a transverse vertical sectional view thereof, taken on the line $y-y$ of Fig. 1, and Fig. 3, represents a longitudinal sectional view taken on the line $z-z$ of Fig. 2.

Referring to the drawings in which like reference letters and numerals indicate like parts in the respective figures, 1 indicates the walls of the furnace which are constructed of brick work, masonry or other suitable material. At the front end of the furnace is located the primary combustion and heat generating chamber 2. This is provided with a solid bottom 3 located above the floor of the furnace and separated from the secondary combustion chamber 4, in which the garbage is cremated, by a partition 5. Around the combustion-chamber 2 and between its walls and the outer walls of the furnace, is formed an air space 6 which communicates with the space below the bottom of the combustion chamber 2, before mentioned.

The numeral 7 indicates a pipe which en-

ters the furnace at the front, and terminates in the space below the bottom of the combustion chamber 2. The said pipe is connected with a blower or other apparatus by which a forced blast of air may be supplied to the furnace.

The front and side walls of the combustion chamber 2, just above the bottom thereof, are provided with ports 9 which connect with the air-space, before mentioned, so as to supply air to support the combustion of the gas supplied to the furnace, and to force the hot gases generated into and through the secondary combustion chamber. Into the upper part of the combustion chamber 2, extends an injector A, by means of which gas or a suitable liquid hydro-carbon may be injected into the said combustion chamber to generate the heat necessary to cremate the garbage. The combustion chamber 2 communicates with the secondary combustion chamber, in which the garbage is burned, by means of an opening 10. The said chamber has a floor constructed partly of transversely-set bars 11, laid horizontally and parallel with each other at a suitable distance above the floor of the furnace. These bars may be made of cast iron, wrought iron or any other suitable material. At one side of the horizontal portion of the floor constructed of the bars, as above described, the floor is made solid and inclined as shown in Fig. 2 of the drawings. The solid portion may be made of metal or other suitable material but is preferably constructed of a metallic plate or plates, as shown. The lower part of the furnace, below the floor is divided into two compartments 12 and 13 by means of a longitudinal vertical partition 14, the said partition serving, with the abutment 15 at one side of the furnace and a rail 16 laid thereon, to support the rails constituting a portion of the bottom of the secondary combustion chamber. The solid portion of the floor rests upon a rail 16' laid upon an abutment 17 at one side of the furnace and upon the rails 11 constituting the horizontal portion of the floor of the furnace. The compartment 12 constitutes a tertiary combustion chamber in which the greasy matters of the garbage and undecomposed gases and vapors from the secondary chamber are finally de-

composed and burned before passing out to the stack. The compartments 12 and 13 communicate with each other at their forward ends by means of flues 18 and 19 with the smoke stack or escape flue of the furnace through which the products of combustion finally pass off. The secondary combustion chamber at the top is provided with a series of apertures 19' provided with covers 20. Through these apertures the garbage to be cremated is inserted. Directly under these openings are formed openings 21 in the side wall of the furnace which are closed by the doors 22. These openings permit a workman, by means of a suitable tool, to work and manipulate the material or garbage to be cremated.

At the rear of the furnace is an opening 23, closed by a suitable door, leading to the tertiary combustion chamber, through which the ashes or residue from the consumed garbage may be removed.

24 indicates an ash-pan which is mounted on rollers and occupies, normally, a position in the furnace directly below the bars, which virtually constitute a grate and permit the ashes of the cremated material to fall through into said pan.

The operation of my invention will be readily understood in connection with the above description, and is as follows: The furnace is started by injecting gas or fluid hydro-carbon through the injector into the primary combustion chamber, where it is ignited. Air is then injected through pipe 7 to support and urge combustion, furnish a blast, and to regulate the flame so as to give it an oxidizing effect. The air enters the primary combustion chamber through the ports at the sides and front of the same and meeting with the ignited gases or hydro-carbon, creates a complete or perfect combustion of the same and thereby, an intense heat. The heated products are forced from the primary to the secondary combustion chamber and from thence through the tertiary combustion chamber, and the flue 13, to the stack or escape flue of the furnace, the blast being of sufficient force to carry the products directly through all the flues to the escape flue or stack. After the secondary combustion chamber and the flues below the same have become intensely heated, the garbage to be consumed is fed in through the openings directly above the solid bottom of the secondary combustion chamber. The watery or liquid portions drain off and pass to the ash-pan below, and the solid portions are dried by the waste heat passing beneath the plate through the flue 13 and the hot products passing from the primary into the secondary combustion chamber. There is always a considerable percentage of grease in garbage which passes with the fluid portions to the ash pan; this grease is subsequently taken up by the hot products of combustion passing into the tertiary combustion chamber 12, and adds fuel to the fire. The said chamber being

intensely heated, especially at or about the ports 18, 19 the volatilized grease is not only converted into gas but the gas is consumed so that the ultimate products of combustion resulting from thorough and complete decomposition of the garbage, pass off as hydrogen and carbonic acid gases without organic odors or noxious vapors due to imperfect cremation. It will be observed that initially the gaseous fuel is burned in the primary combustion chamber simply to generate the heat necessary to effect the cremation of the garbage in the secondary combustion chamber, and that the final and thorough decomposition or cremation of all gaseous products takes place in the tertiary combustion chamber.

By the construction and method of operation of my furnace, the gaseous products entering the furnace and developed from the drying and cremating garbage are compelled to pass through three successive heatings by which they are ultimately reduced to hydrogen and carbonic acid gases without contamination with any organic vapors or undecomposed matter.

Having now described my invention, what I claim is—

1. The combination, in a crematory furnace, of a primary combustion chamber, a secondary combustion chamber having its floor composed partly of a solid portion and partly of parallel bars, a tertiary combustion chamber below the bars, and an escape flue below the solid portion of the secondary chamber and communicating with the tertiary chamber, whereby the gaseous products of combustion of the garbage and the refuse grease are thoroughly consumed, substantially as described.

2. In a crematory furnace, the combination of a primary combustion chamber and a secondary combustion chamber, the latter having its floor constructed partly of horizontal bars set over a tertiary chamber and partly of an inclined plate set over the exit flue of the furnace, whereby the garbage is drained and partly dried preparatory to its cremation, substantially as described.

3. The combination, in a crematory furnace, of a primary combustion chamber having a surrounding superheating air space communicating with its interior by suitable ports, and means by which a forced blast of air may be injected into said space and combustion chamber, a secondary combustion chamber communicating with the primary chamber, a tertiary combustion chamber communicating with the secondary chamber, and the exit flue communicating with the secondary chamber, and the exit flue communicating with the tertiary chamber and with the stack or escape flue of the furnace, substantially as described.

4. In a crematory furnace, the combination with the secondary combustion chamber, of the tertiary combustion chamber, the exit flue

communicating therewith by means of suitable ports, the horizontal portion of the floor located above the tertiary combustion chamber and the inclined solid portion of the floor
5 located over the escape flue, whereby the garbage is initially dried preparatory to cremation, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

SAMUEL H. BROWN.

Witnesses:

WM. M. STOCKBRIDGE,
THEO. L. GATCHEL.