

No. 669,632.

Patented Mar. 12, 1901.

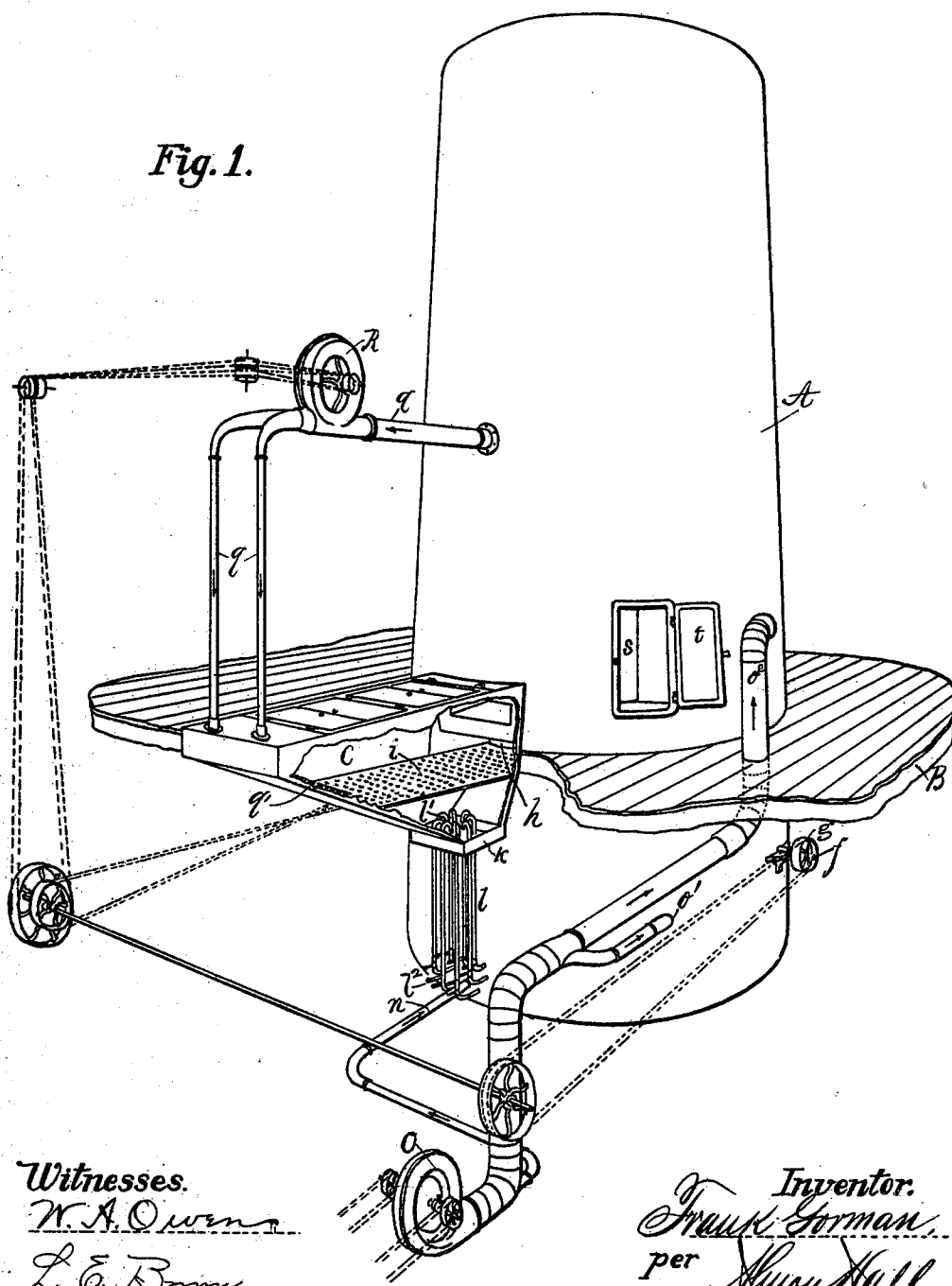
F. GORMAN.
GARBAGE FURNACE.

(Application filed Feb. 5, 1900.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



Witnesses.

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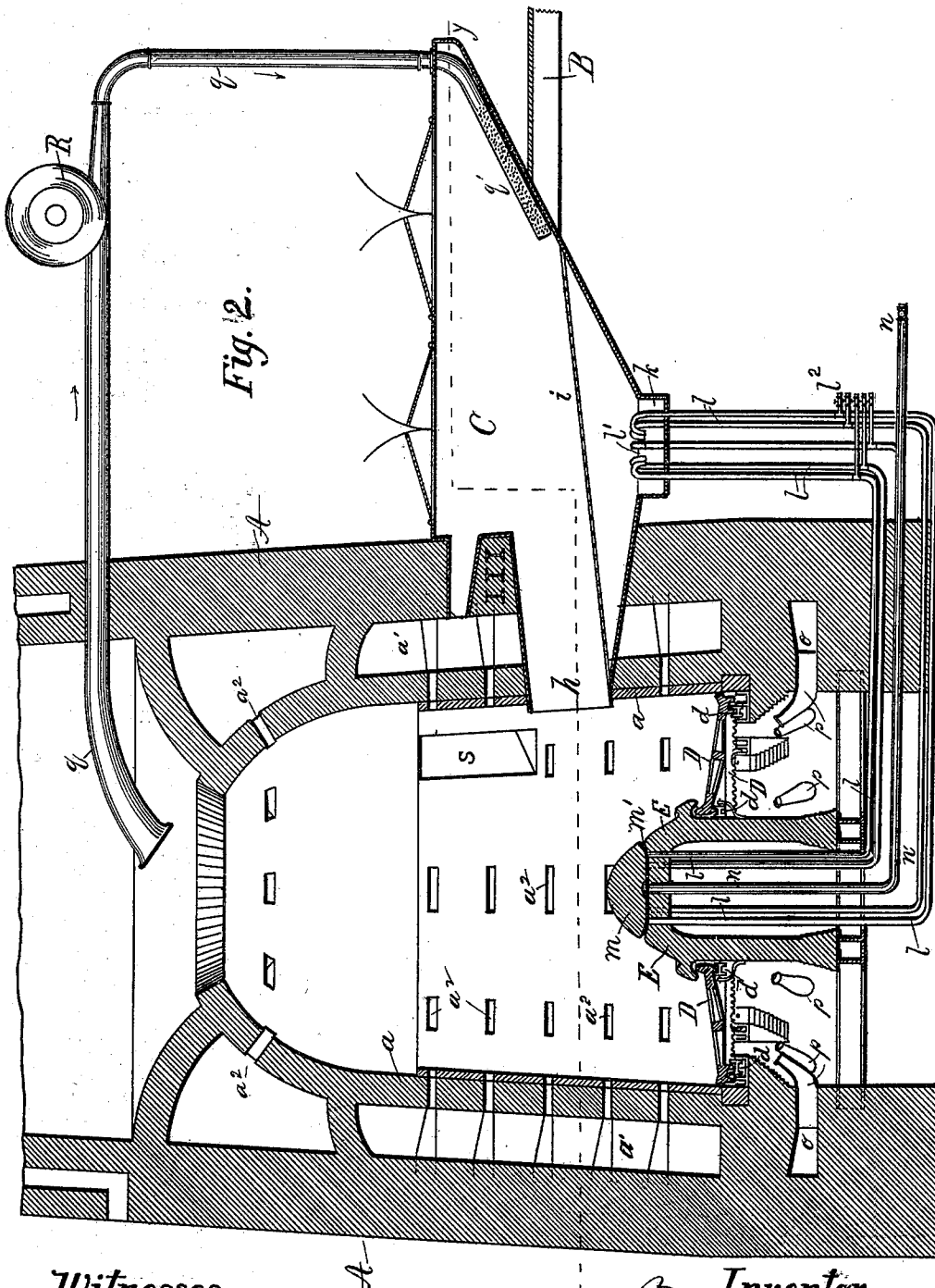
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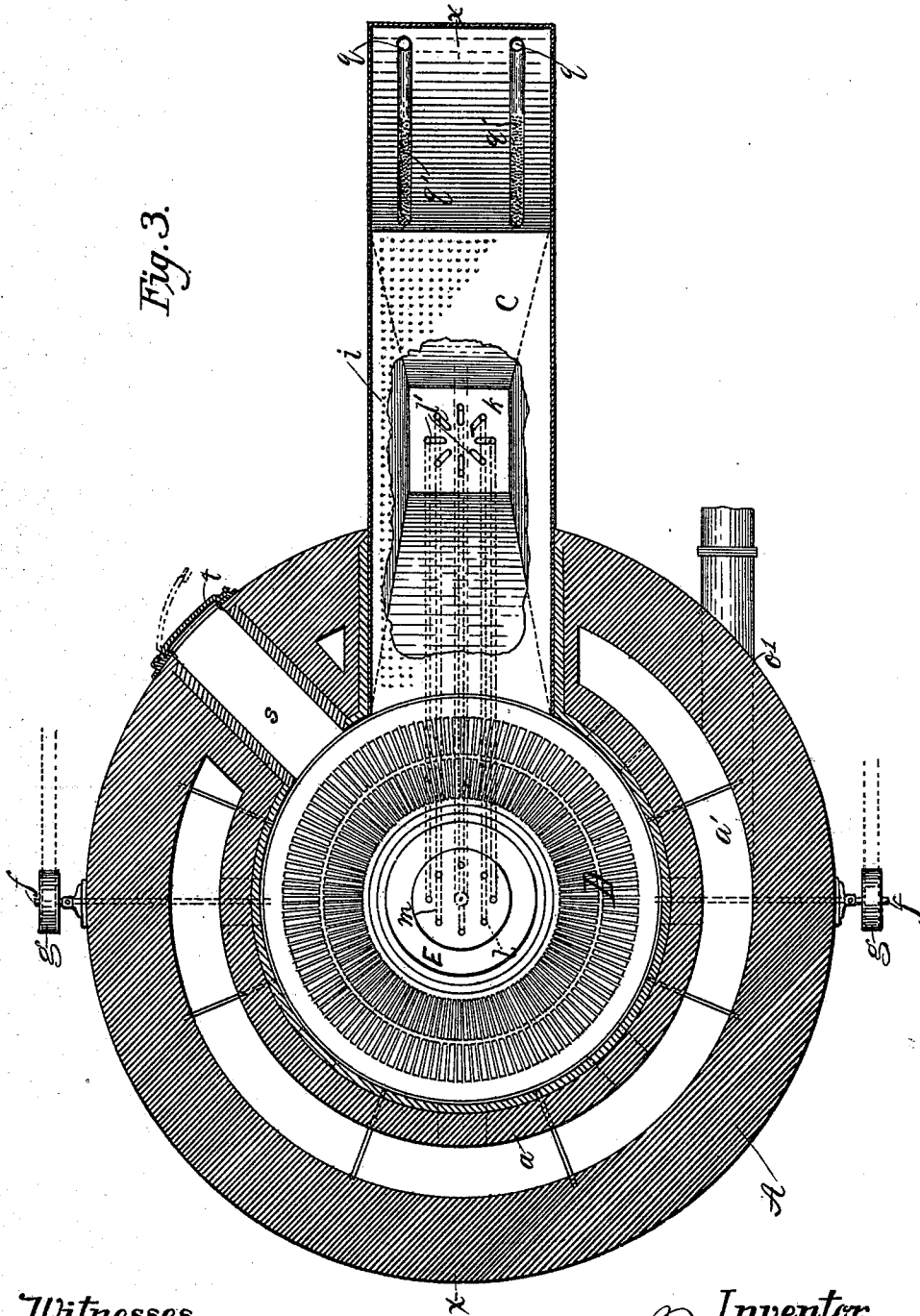
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3 Sheets—Sheet 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANK GORMAN, OF TOLEDO, OHIO.

GARBAGE-FURNACE.

SPECIFICATION forming part of Letters Patent No. 669,632, dated March 12, 1901.

Application filed February 5, 1900. Serial No. 3,949. (No model.)

To all whom it may concern:

Be it known that I, FRANK GORMAN, a citizen of the United States, residing at Toledo, Lucas county, Ohio, have invented certain new and useful Improvements in Garbage-Furnaces, of which the following is a specification.

My invention relates to and its object is to provide simple, economical, and efficient means for the cremation of garbage, offal, and the like and the fluids arising therefrom without smoke or stench. I attain these results by means of the devices and arrangement of parts hereinafter described and shown and illustrated in the accompanying drawings, made part hereof, in which—

Figure 1 is a perspective view of my furnace with the main floor and hopper, hereinafter referred to, broken away, showing the arrangement and relation of parts; Fig. 2, a central vertical section on line *x x*, Fig. 3; and Fig. 3, a sectional top plan view on line *y y*, Fig. 2.

Like letters of reference indicate like parts throughout the drawings.

In the drawings, A is the furnace-wall, of cupola form, extending from the ground up through the main floor B of the building and terminating in a stack or chimney.

C is a hopper at one side of the furnace, the top of which hopper extends above the floor and the bottom of which inclines downwardly beneath the floor toward the furnace. The hopper is provided at top with suitable folding doors and is of such height and dimension as to permit carts and wagons to dump their contents into the hopper.

The interior of the furnace is lined with refractory material, such as fire-brick, the inner wall *a* being somewhat removed from the outer wall, so that there is an annular space *a'* between the two. The inner wall is arched or dome-shaped at top, with an opening there-through leading up into the stack. A series of openings *a²* lead from the annular chamber *a'* into the combustion-chamber, which is circular in horizontal section.

The grate D at the bottom of the furnace-chamber is circular and to permit the rotation of this grate about a central hollow pillar E is supported on rollers *d*. The lower

margin of the outer rim of the grate D is toothed, as a gear-wheel, and these teeth are engaged and driven by pinions (not shown in the drawings) on shaft *f*, provided with pulleys *g*, which are connected with any suitable source of power. The pillar E is of fire-clay or other suitable refractory material. Through the furnace-walls, above the revolving grate-bars and nearly on a level with the floor, is an opening *h*, through which the hopper C discharges onto the revolving grate D. It will be seen that by this arrangement, although the material to be burned is fed to the furnace at but one point, the material is by the rotation of the grate-bars evenly distributed over the surface of the grate.

The hopper C is provided with a false bottom, consisting of a screen *i*, which slopes to the inlet of the furnace. Below the screen the bottom or floor of the hopper is formed into a basin, as at *k*, for the reception of fluids, which are strained through the screen *i*. From the basin *k* leads a series of pipes *l* downwardly, then through the wall of the furnace inwardly, and thence up through the hollow pillar E, where they terminate in a horizontal plane a trifle below their inlet in the basin *k*. Above the mouths of the pipes *l* is secured a dome-shaped piece *m*, flat at bottom, leaving a thin flat space *m'* between the piece *m* and the top of the pipes and the top of the pillar E.

n is a pipe leading from a blower into the space *m'*. The mouths or outlets of the pipes *l* are arranged in a circle surrounding the outlet end of the air-pipe *n*. The inlet ends of the pipes *l* are curved downwardly, as at *l'*, siphon-like, to prevent the pipes from becoming clogged, the basin *k* serving as a catch-basin. Each of the pipes *l* is provided with a nozzle and cock *l²*, by means of which a small steam-hose may be connected with the pipes, thus providing for clearing these pipes of obstructions. Fluids flowing into the basin *k* will by their own gravity find their way into the space *m'*, from whence they are driven radially, as an attenuated spray, by force of the air-blast through the pipe *n*.

In the wall of the furnace beneath the level of the revolving grate-bars is a circumferential chamber *o*. From this chamber lead in-

wardly into the space beneath the grate-bars a series of twyers *p*, equidistantly spaced around the chamber and projecting upwardly toward the grate-bars. The chamber *o* is suitably connected, as at *o'*, with a blower *O*. This blower is also connected, as at *o''*, through the wall of the furnace with the annular chamber *a'*. The conduits leading from the blower *O* are provided with any suitable means for controlling the passage of air therethrough, though none are shown in the drawings.

Above the combustion-chamber, in the path of the flame or heated products of combustion, is located a pipe *g*, having an enlarged inlet leading to an exhaust fan or blower *R*, and thence into the hopper *C*, where the pipe terminates in a length having numerous perforations, as at *g'*. The blower *R* withdraws from the furnace exceedingly-hot gases, which are expelled into and through the contents of the hopper and thence back into the furnace. Thus the moisture in the contents of the hopper is evaporated, the vapor being driven into the hot furnace, where it is consumed, drying the contents of the hopper preparatory to their reaching the furnace.

Through the masonry of the furnace, at a convenient height above the floor, is an opening *s*, having a door *t*, by means of which access is had to the interior chamber of the furnace. Through this door the progress of the work within may be observed, and by means of forks the material resting upon the revolving grate may, if necessary, be stirred and loosened. Through this door when necessary fuel is also thrown in upon the grate.

The operation of my device is as follows: A fire being started in the furnace on the grate and the blowers *O* *R* being in operation, the doors or lids of the hopper are raised and the material to be incinerated is dumped into the hopper. Here by means of the hot-air blast it is dried as it slowly descends the perforated floor *i* on its way to the furnace. The fluids from the charge pass down through the screen *i* into the catch-basin *k*. From thence they flow through the pipes *l* into the flat horizontal space *m'*, between the top of the pillar *E* and the piece *m*, and from whence it is ejected in a fine spray to be further vaporized and burned by the intense heat of the furnace. In case the contents of the hopper should clog the passage *h*, it may be readily cleared with a stout fork through one of the upper doors of the hopper, which are only opened for this purpose and for feeding the hopper. Under some conditions of the fire it is found desirable to admit a blast into the annular chamber *a'*, and thence into the furnace through the openings *a''*. This blast, regulated as desired, is applied as the exigencies of the fire and the character of the material being fed to the furnace may require.

It is found in practice that garbage-furnaces constructed upon the principle here described are entirely sanitary and that garbage, refuse, dead animals, night-soil, and

the like are consumed without perceptible smoke or stench and with the use of a comparatively small amount of fuel.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a garbage-furnace, a combustion-chamber circular in horizontal section, a revoluble grate therein, a hopper for the reception of garbage at the side of the furnace having its outlet above the grate, a screen in the hopper, a basin below the screen, conduits having their inlets in the basin and their outlets in the furnace, and a spraying device at the outlet ends of said conduits.

2. In a garbage-furnace, a garbage hopper or receptacle, means for separating the liquids in said receptacle from the solids, means for conveying said liquids into the furnace, and means for spraying said liquids within the furnace.

3. In a garbage-furnace, a combustion-chamber, a hopper for the reception of garbage at the side of the furnace having its outlet above the grate, a screen in the hopper, a basin below the screen, conduits having their inlets in the basin and their outlets in the furnace, a spraying device at the outlet ends of said conduits, combined with a pipe or tube leading from the path of the flame or hot gases in such furnace into said hopper or receptacle, and a blower connected with said conduit adapted to discharge a portion of said hot gases into and through said hopper or receptacle.

4. In a garbage-furnace, a horizontally-revoluble circular grate, means for revolving said grate, twyers beneath the grate discharging upwardly through the grate, and a hopper at the side of the furnace and above the grate for feeding garbage by gravity upon the top of the grate.

5. A garbage-furnace comprising a cupola, a combustion-chamber therein circular in horizontal section, an upwardly-projecting central pillar in said combustion-chamber, a horizontally-revoluble grate adapted to rotate about said pillar, twyers discharging beneath the grate, a hopper or receptacle at the side of the furnace adapted to feed into the furnace by gravity, means for separating and conveying the fluids from the hopper or receptacle into the furnace, means in the furnace for spraying the fluids discharged therein, and means for conducting a portion of the hot products of combustion into and through the contents of the hopper or receptacle.

6. A garbage-furnace comprising a cupola, a combustion-chamber therein circular in horizontal section, an upwardly-projecting central pillar in said combustion-chamber, a horizontally-revoluble grate adapted to rotate about said pillar, twyers discharging beneath the grate, a hopper or receptacle at one side of the furnace adapted to feed into the furnace by gravity, means for separating and conveying the fluids from the hopper or re-

ceptacle into the furnace, means in the furnace for spraying the fluids discharged therein, means for conducting a portion of the hot products of combustion into and through the
5 contents of the hopper or receptacle, annular chambers within the walls of the furnace, openings between said annular chambers and the combustion-chamber of the furnace, and means for conducting a regulated air-blast into said annular chambers.

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In presence of—
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