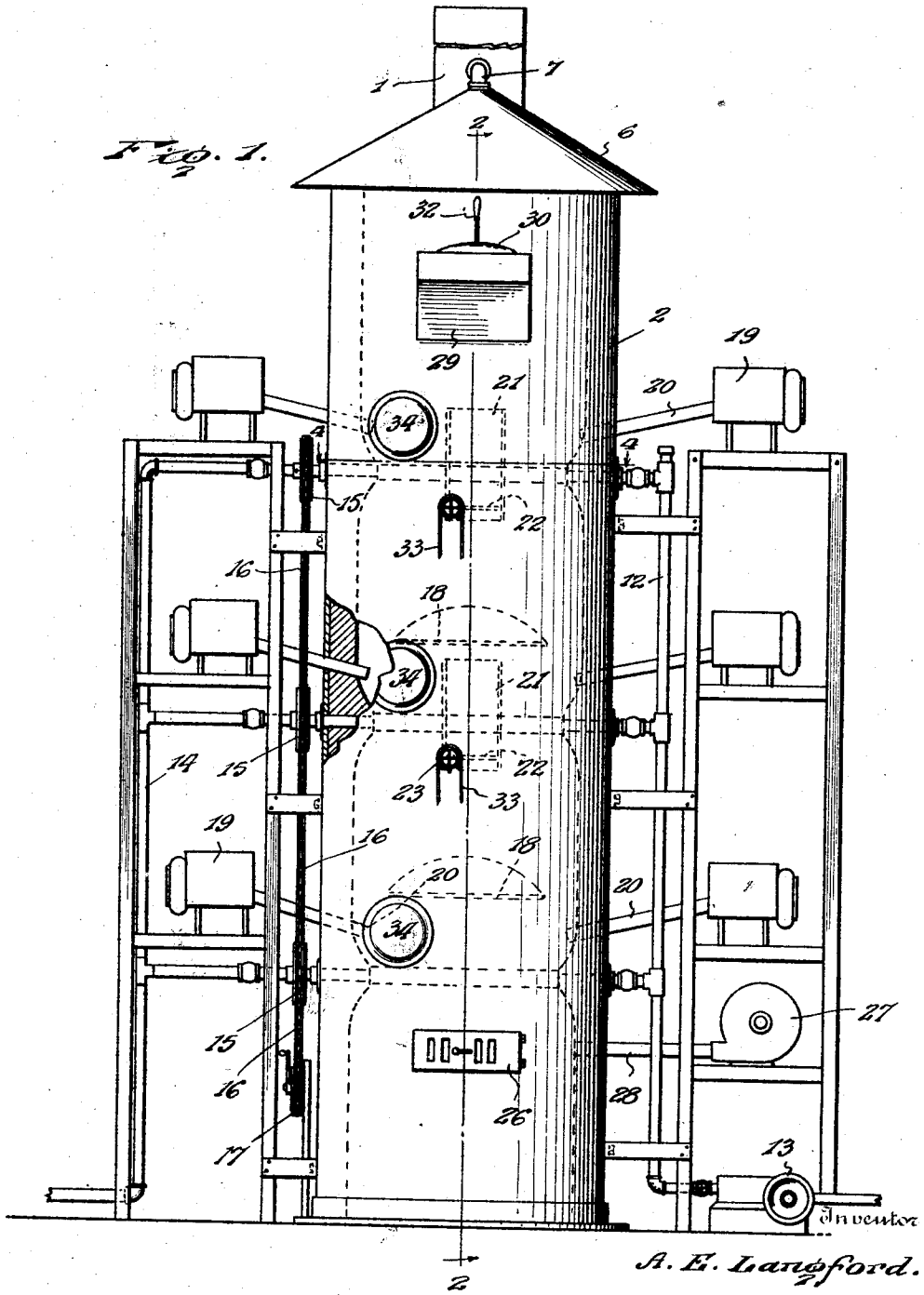
Sept. 30, 1930. A. E. LANGFORD 1,776,914

GARBAGE INCINERATOR

Filed April 25, 1928 3 Sheets-Sheet 1

Fig. 1.



Inventor

A. E. Langford.

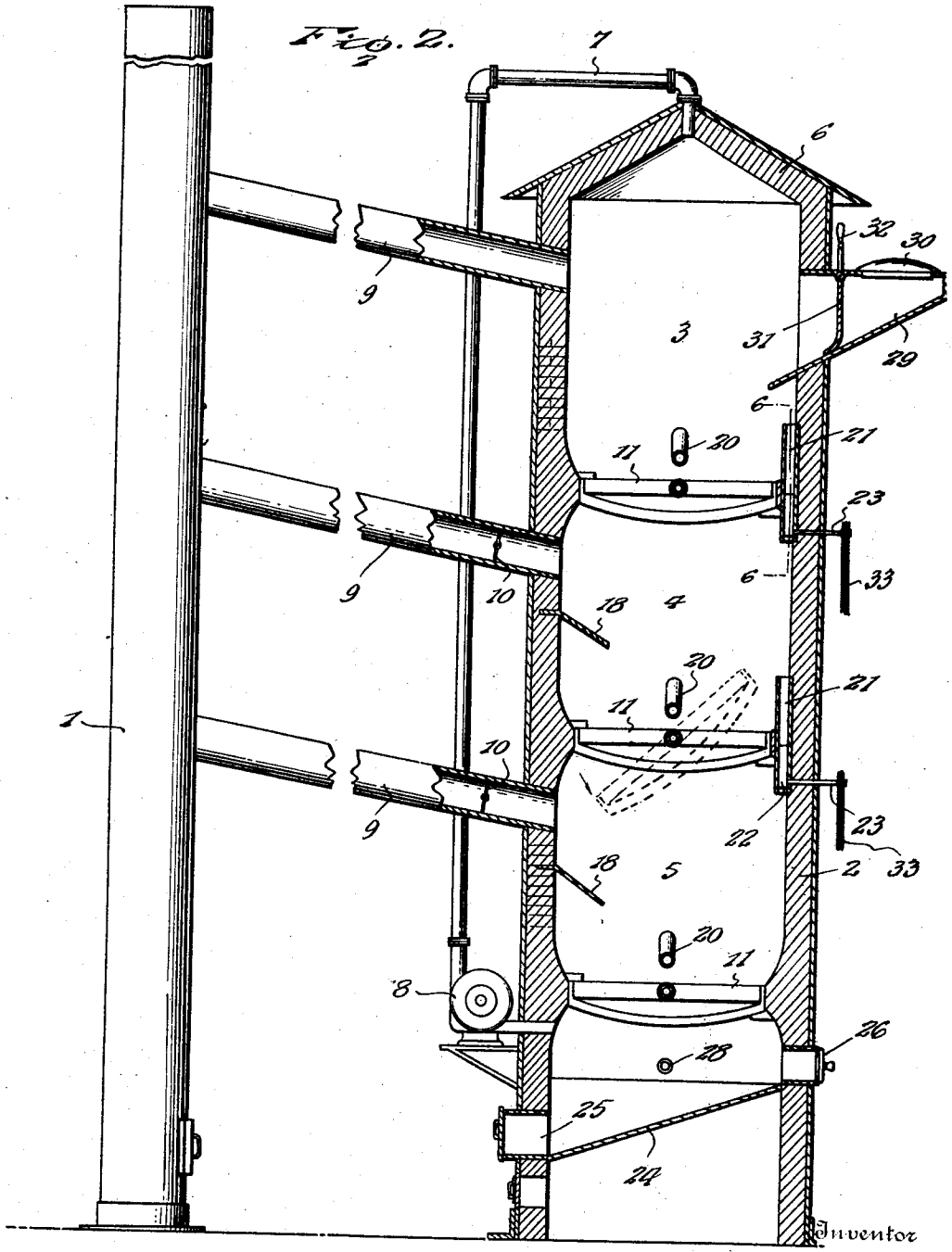
By Lacey & Lacey, Attorney.

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Fig. 2.



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GARBAGE INCINERATOR

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Fig. 4.

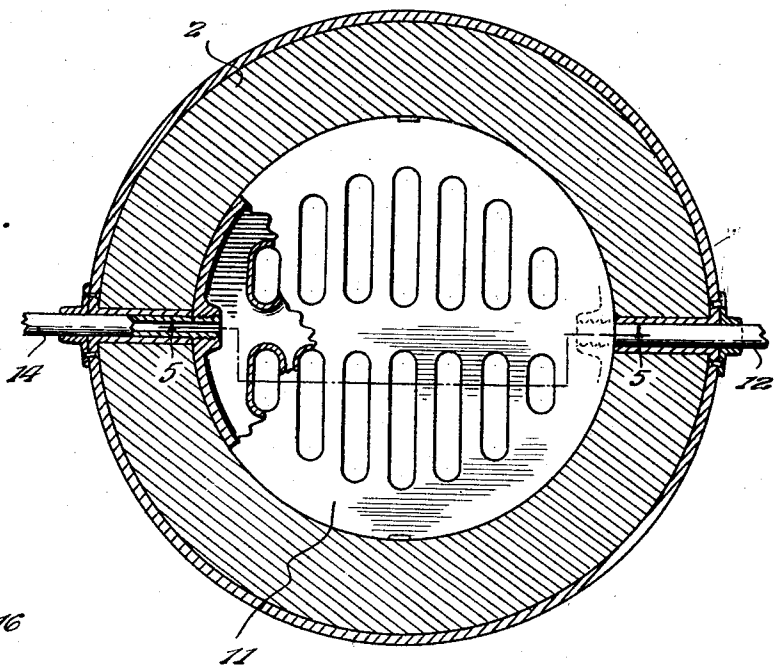


Fig. 3.

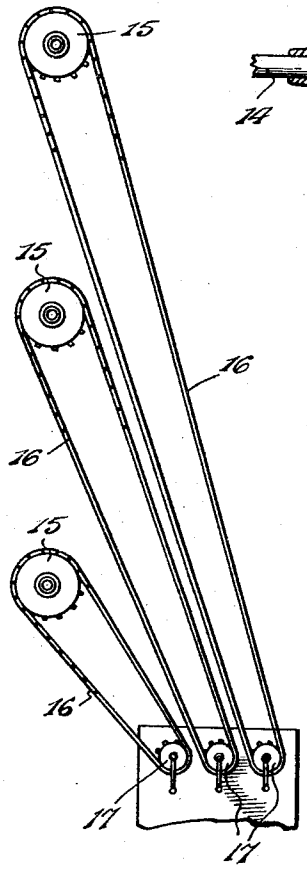
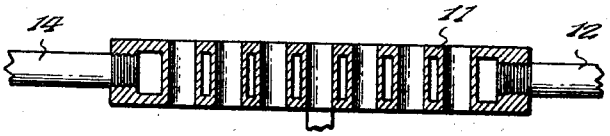


Fig. 5.



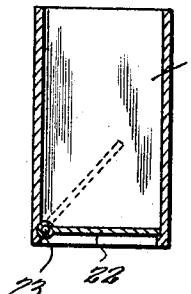


Fig. 6.

Inventor

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Patented Sept. 30, 1930 1,776,914

UNITED STATES PATENT OFFICE

ADRIAN E. LANGFORD, OF PENSACOLA, FLORIDA

GARBAGE INCINERATOR

Application filed April 25, 1928. Serial No. 272,818.

This invention provides a furnace especially adapted for the burning of refuse, such as garbage, which is usually damp and contains light, heavy and metal particles.

The invention contemplates a furnace including vertically alined chambers separable by tilting grates, whereby provision is had for discharging the contents of one chamber into the chamber next below, so that the light matter may be quickly consumed in the top chamber and the heavy matter in the bottom chamber.

The invention provides for utilization of the vapors driven off from the refuse during the process of incineration, the cooling of the grates to prevent warping and burning thereof, the centralizing of the material when dumped from one chamber to the other and a positive circulation of air through the several chambers.

While the drawings illustrate a preferred embodiment of the invention, it is to be understood that in adapting the means to meet specific needs and requirements the design may be varied and such other changes in the minor details of construction may be resorted to within the scope of the invention as claimed, without departing from the spirit thereof.

For a full understanding of the invention and the merits thereof, reference is to be had to the following description and the drawings hereto attached, in which,—

Figure 1 is an elevational view of a refuse incinerator embodying the invention.

Figure 2 is a vertical sectional view on the line 2—2 of Figure 1.

Figure 3 is a detail view showing the means provided for independent operation of the grates.

Figure 4 is an enlarged horizontal sectional view on the line 4—4 of Figure 1.

Figure 5 is a detail view of the grate on the line 5—5 of Figure 4.

Figure 6 is an enlarged detail sectional view on the line 6—6 of Figure 2.

Corresponding and like parts are referred to in the following description and designated in the several views of the drawing by like reference characters.

The numeral 1 denotes a stack and 2 the body of the furnace which, in the preferred construction, extends vertically for some distance, and comprises a plurality of chambers, designated by the numerals 3, 4 and 5. The furnace may be of any determinate construction and is closed by a conical top 6 to the apex of which is connected a pipe 7, whereby vapors are carried off and returned to the ash pit for promoting combustion and to prevent contamination of the atmosphere. A blower 8 in the length of the pipe 7 draws the vapors from the furnace and forces them into the ash pit and through the furnace.

Flues 9 connect the upper portion of each of the chambers 3, 4 and 5 with the stack 1. The flues connected with the chambers 4 and 5 are supplied with dampers 10 to admit of controlling the flow of smoke and gases therethrough. The flue 9 connected with the top chamber 3 is devoid of a damper so that the flow therethrough may be unobstructed at all times.

Each of the chambers is provided with a grate 11 which is mounted to tilt, as indicated by the dotted lines in Figure 2. The grates 11 are hollow to admit of a cooling medium circulating therethrough to prevent warping and burning. A pipe 12 connects with each of the grates 11 to supply a cooling medium, such as water, thereto. A pump 13 in the length of the supply pipe 12 draws water from a pond, or other source of supply, and forces the same though the grates. A return pipe 14 connects with each of the grates 11 to carry off the water therefrom and return it to the source of supply to be used over again in the cooling of the grates. One of the journals of the grates is extended and provided with a sprocket wheel 15 which coacts with a sprocket chain 16 which admits of convenient operation of the grates from a point adjacent the base of the furnace. A sprocket wheel 17 is provided for each of the sprocket chains 16 and is conveniently positioned so as to be readily accessible from the floor or ground.

In this manner each of the grates 11 may be tilted to dump the material supported thereby. A deflector 8 projects laterally from the inner wall of each of the chambers 4 and

5 and receives the material when dumped from the grate above and effects delivery thereof centrally of the grate next below. This prevents piling of the material at one side of the chamber, which otherwise would happen when dumping the material from one chamber to the next. The numeral 19 denotes oil burners which are connected by pipes 20 to the respective chambers of the furnace. The pipes 20 are arranged to throw a flame across the lower portion of each of the chambers to consume the material therein supported upon the grates.

A by-pass 21 is provided at one side of the furnace opposite the grates of the chambers 3 and 4, and assures a positive flow of gases from the chamber 5 to the chamber 4 and from the latter chamber to the top chamber 3. A damper 22 at the bottom of the by-pass 21 enables control of the air therethrough. The dampers 22 are controllable from the outside by means of stems 23 which pass through the wall of the furnace and have suitable handles at their outer ends. The by-passes 21 project above and below the respective grates, as indicated most clearly in Figure 2 of the drawings.

A chute 24 in the ash pit directs the ashes and any unconsumed material through a clean out opening 25 in a side of the furnace. A damper 26 controls the admission of air for supporting combustion, and this may be supplemented by a positive draft from a blower 27 which is admitted into the ash pit through a pipe 28.

A hopper 29 is located at one side of the top chamber 3 and has a capacity approximating a load of garbage, or other refuse to be incinerated. The bottom of the hopper 29 is inclined to automatically deliver the refuse into the chamber 3. The refuse is supplied to the hopper 29 through an opening in the top thereof which is closed by means of a cover 30. A cut-off 31 normally closes the opening in the side of the furnace with which the hopper 29 connects. The cut-off 31 is pivoted and is adapted to be swung into open position by means of a lever 32 which is exterior to the furnace and projects above the hopper 29.

When the furnace is in operation flame from the pipes 20 plays across the several chambers. The refuse to be burned is supplied to the hopper 29 which is closed by replacement of the cover 30. The cut-off 31 is now swung into open position to admit of the refuse discharging from the hopper into the top chamber 3 in which the light matter is consumed.

After a short time the grate supporting the material in the chamber 3 is tilted to dump the material into the chamber 4 wherein the heavier material is consumed wholly or in part, and after the lapse of a determinate period the material is dumped from the chamber 4 into the chamber 5 by tilting the grate separating said chambers. The combustible material not consumed in the intermediate chamber 4 is wholly consumed in the bottom chamber 5, the ashes and metal or other non-consumed material being discharged from the chamber 5 into the ashpit and thence through the discharge opening 25. The vapors driven off from the refuse are drawn into the pipe 7 and delivered into the ash pit to be circulated through the several chambers and prevent contamination of the atmosphere by direct discharge of the vapors therein. In the event of the material obstructing passage of gases through the grates of the chambers 3 and 4, circulation may be maintained through the by-passes 21 by opening the dampers 22 more or less, as required. The cut-off 31 normally remains closed and is opened only when it is required to discharge the refuse from the hopper 29 into the furnace, and at such time the cover 30 is in place to prevent the escape of odors.

The dampers 22, like the grates 11 may be operated from the ground floor by means of chains 33. The deflectors 18 besides directing the garbage to a central point of the furnace loosens and lightens it for better action of the flame thereon. The burner units may also be independently controlled from the ground floor by a switch. Man holes 34 are provided in a side of the furnace just above each of the grates to admit of inspection of the flame from the outside. The structure will be firmly braced to insure the provision of a firm and substantial arrangement.

Having thus described the invention, I claim:

1. A refuse incinerator comprising a furnace body having a damper controlled opening at the top for admitting the refuse and a pit at the bottom for the residue, tilting grates subdividing the body into a plurality of vertically disposed combustion chambers, a deflector at one side of each of the chambers to direct the material from the grate above to the center of the grate next below, and a damper controlled by-pass at the opposite side of each of the chambers for controlling the flow of gases from the lower chamber to the chamber next above.

2. A refuse incinerator comprising a furnace body having a damper controlled opening at the top for admitting the refuse and a pit at the bottom for the residue, tilting grates subdividing the body into a plurality of vertically disposed combustion chambers, a deflector at one side of each of the chambers to direct the material from the grate above to the center of the grate next below, a damper controlled by-pass at the opposite side of each of the chambers for controlling the flow of gases from the lower chamber to the chamber next above, and a pipe connecting the top of the furnace with the pit and having a blower in its length.

3. A refuse incinerator comprising a furnace body characterized by an approximately conical shaped top, and having a lateral feed opening adjacent the top, means associated with the feed opening to prevent direct communication with the atmosphere, tilting grates subdividing the furnace body to provide a plurality of vertically disposed combustion chambers, a deflector at one side of the chambers for centralizing the material when dumped from one chamber to the other, damper-controlled by-pass at the opposite side of and between adjacent combustion chambers, means for independent operation of the grates and by-pass dampers from a point adjacent the base of the furnace, a pipe connecting the apex of the furnace top with the ash pit and having a blower in its length, a stack at one side of the furnace, and flues connecting the several combustion chambers with the stack, the flues below the topmost one having dampers.

In testimony whereof I affix my signature.

ADRIAN E. LANGFORD. [L. S.]