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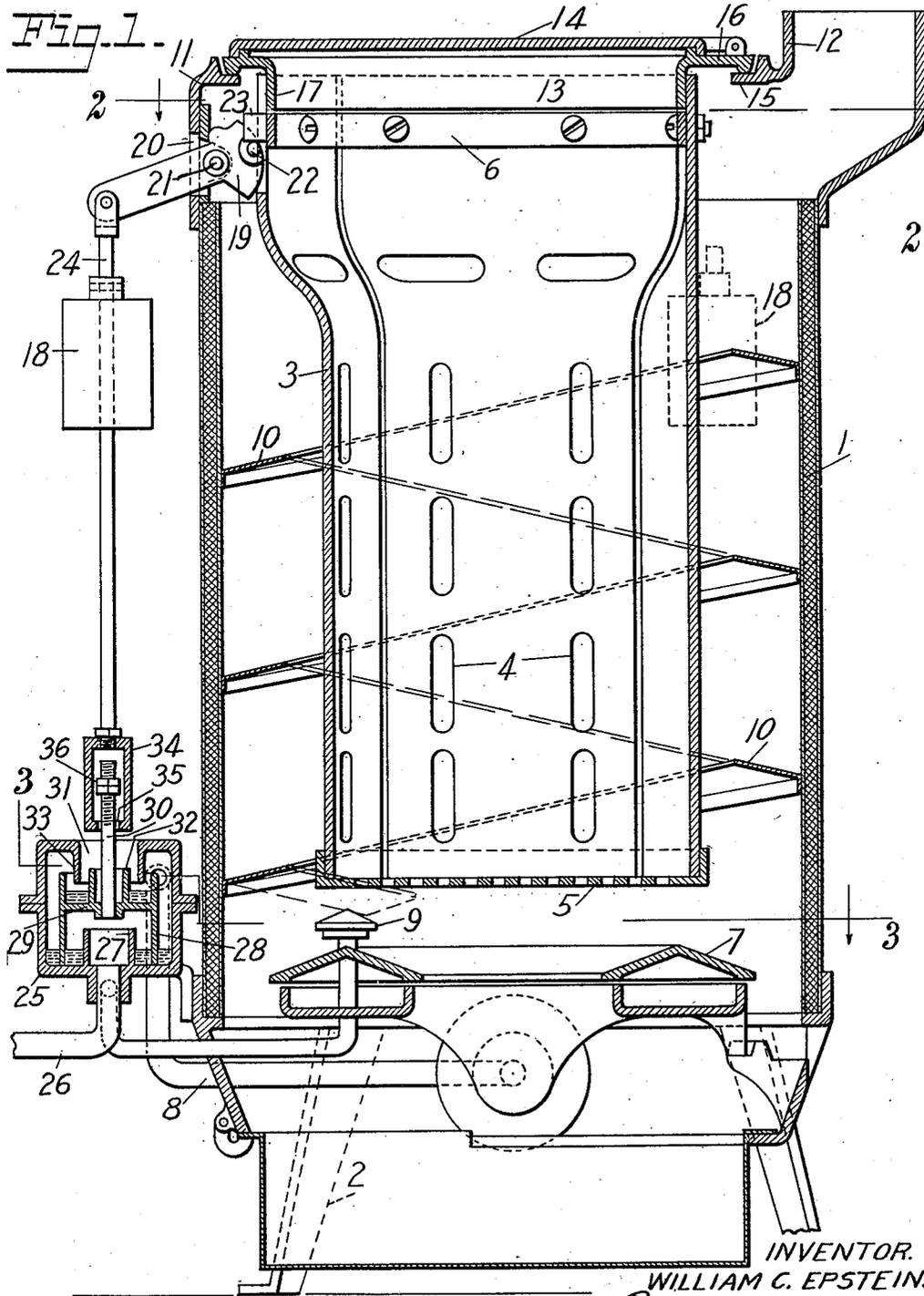
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W. C. EPSTEIN

INCINERATOR

Filed Dec. 23, 1926

2 Sheets-Sheet 1



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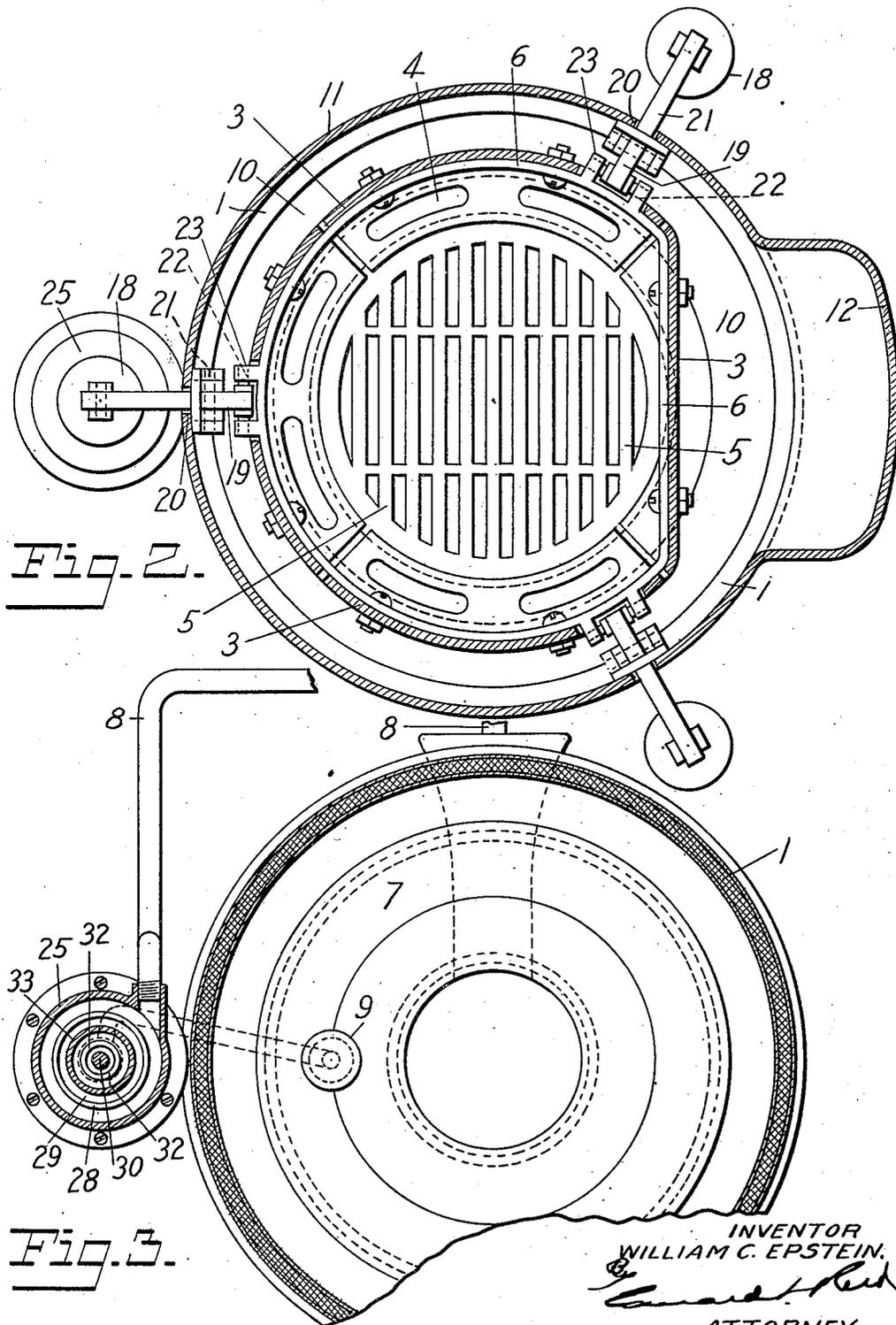
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

WILLIAM C. EPSTEIN, OF DAYTON, OHIO, ASSIGNOR TO THE DUO-TOR MANUFACTURING COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO.

INCINERATOR.

Application filed December 23, 1926. Serial No. 156,597.

This invention relates to incinerators and more particularly to a garbage incinerator designed for domestic use.

One object of the invention is to provide such an incinerator in which the operation of the burner will be automatically controlled.

A further object of the invention is to provide such an incinerator in which the operation of the burner will be controlled by the weight of material deposited in the hopper.

A further object of the invention is to provide such an incinerator which will be simple in its construction and operation and in which the controlling mechanism will be of such a character that its operation will not be affected by the intense heat to which it is subjected.

Other objects of the invention will appear as the device is described in detail.

In the accompanying drawings Fig. 1 is a vertical sectional view taken centrally through an incinerator embodying my invention; Fig. 2 is a transverse sectional view taken on the line 2—2 of Fig. 1, looking in the direction of the arrows; and Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 1.

In these drawings I have illustrated one embodiment of my invention and have shown the same as comprising a movable hopper, the movement of which is so controlled that the hopper will be retained normally in an elevated position but when substantial quantities of material, such as garbage, are deposited in the hopper the latter will move downwardly under the weight of that material. The burner which is associated with the hopper is normally inoperative and is rendered operative by the downward movement of the hopper and preferably is again rendered inoperative by the upward movement of the hopper after the material therein has been consumed. The incinerator as a whole and the means for mounting the hopper and controlling the burner may take various forms and that embodiment here illustrated has been chosen for the purposes of illustration only.

In the present form of the invention the incinerator comprises a casing 1 which is preferably cylindrical in form and is supported at its lower end by legs 2. Mounted within the casing is a hopper 3 which, in the present instance, is substantially cylindrical

in form but has its upper portion flared and its rear wall flattened, as shown in Fig. 2. This hopper is of a diameter somewhat less than the internal diameter of the casing and has its walls provided with openings 4. In the present instance, the hopper is made up of a plurality of sections which are rigidly connected one to the other at the lower ends by means of a flanged bottom plate or grate 5 and at their upper ends by means of an annular band or collar 6 arranged within the hopper and rigidly secured to the several sections thereof, this band being in the present instance, spaced a short distance from the top of the hopper for a purpose which will hereinafter appear. The lower end of the hopper is shown as spaced some distance above the bottom of the casing and a burner, in the present instance an annular gas burner 7, is arranged at the lower end of the casing beneath the hopper. This burner has connected therewith the usual gas supply pipe 8 and is provided with a pilot burner 9. I have also shown the casing 1 as having a spiral rib or deflector 10 extending inwardly therefrom and having its inner edge spaced a short distance from the hopper so that the flame and products of combustion will be caused to rise about the hopper in close contact therewith and to pass through the openings in the walls of the hopper.

The upper end of the casing is closed by a top casting or head 11 which forms part of the casing and which has at its rear side an outlet 12 adapted to be connected with the flue. The central portion of this head is provided with an opening 13 in line with the hopper and through which the material may be deposited in the hopper. This opening is normally closed by a hinged lid 14. In the present construction I have shown the top casing or head in two parts, one an outer annular part secured to the upper edge of the body of the casing and having an inwardly projecting flange 15. The second part of the head or top casting is in the form of a top plate 16 which rests upon the flange 15 and in which the inlet opening 13 is formed. By removing the top plate 16 the hopper can be lifted bodily from the casing.

Associated with the hopper and with the burner 7 are means controlled by the weight of material deposited in the hopper for controlling the operation of the burner. Preferably the hopper is movably mounted with-

in the casing and the movement thereof is utilized to control the operation of the burner. The hopper may be mounted in any suitable manner and the movement may be of any desired character so long as the arrangement is such that the weight of the material deposited in the hopper will impart movement thereto. In the present construction, the hopper is mounted for vertical bodily movement, that is the hopper as a whole moves in a substantially vertical line. Preferably the casing is provided with suitable means for guiding the hopper in its movement and, as here shown, the top plate 16 of the casing has a downwardly extending annular flange 17 which extends into the upper end of the hopper and which is of such a length that the hopper will not be moved out of engagement therewith in the normal operation thereof. This flange does not form a support for the hopper but merely constitutes a guide therefor and the hopper is supported by a suitable device or devices carried by the casing and having supporting connection with the hopper. In the present instance, where the hopper has bodily movement, a plurality of supporting devices are arranged about the hopper and each supporting device is connected with the hopper. Each supporting device is acted upon by a weight 18 or other means for counterbalancing the weight of the hopper and thus yieldably supporting the hopper within the casing. In the present construction the supporting devices are in the form of levers 19 extending through slots 20 in the annular portion of the top casting and pivotally mounted, as shown at 21. The inner end portion of each lever is provided with oppositely extending pins 22 which engage beneath lugs 23 secured to the hopper and, in the present instance, carried by the band 6 and projecting beyond openings in the upper part of the hopper. The outer portions of the levers extend beyond the exterior of the casing and have pivotally connected therewith rods 24 on which are mounted the weights 18. The combined weight of the several weights 18 is such that when the hopper is empty or substantially empty it will be moved into its elevated position, the upward movement of the hopper being limited by the contact of the inner portion of the lever 19 with the bracket or pivot lug on the top casting 11. The weights, or other counterbalancing means are of such a character that they will yield under a slight additional weight imposed upon the hopper to permit the latter to move downwardly. The counterbalancing action may be regulated so as to cause the hopper to move downwardly when any desired amount of material has been deposited therein.

The movement of the hopper may be utilized in any suitable manner to control the operation of the burner but preferably this movement is transmitted to a valve which controls the flow of gas to the burner and, in the present instance, one of the rods 24 is utilized to transmit this movement to the valve. The valve may be of any suitable character but should preferably be of such a construction that it will quickly open and close the supply line leading to the burner. In the present device, I have utilized a liquid seal valve which comprises an outer casing 25 having an inlet opening arranged centrally of the bottom wall thereof, with which is connected a gas supply pipe 26, and having the burner pipe 8 connected with the upper portion thereof. The inlet opening in the bottom wall of the casing is surrounded by an upwardly extending boss or flange 27, thus forming between the boss and the outer wall of that casing, a channel adapted to contain a liquid, such as mercury. Mounted within the casing is a substantially cylindrical valve member 28 which is open at its upper and lower ends but has a transverse partition 29 extending across the same between the ends thereof and connected with this partition is a stem 30 which extends through an opening 31 in the top wall of the casing 25 and serves to connect the valve member with its operating mechanism. Extending upwardly from the partition 29 and about the stem 30 is a boss or annular flange 32 which is spaced from the cylindrical wall of the valve member so as to form a channel adapted to receive fluid, such as mercury. Surrounding the opening 31 in the top wall of the casing 25 and extending downwardly therefrom is an annular flange 33 of such a diameter that it will extend into the annular channel between the cylindrical wall of the valve member and the boss 32. When the valve member 28 is unrestrained it will move downwardly into contact with the bottom wall of the casing 25 so that its lower edge will be immersed in the fluid in the casing and the flow of gas from the inlet to the outlet prevented. The weight of the valve member and its associated parts is such that this member will not be lifted by any normal gas pressure. When the valve member is moved upwardly the lower edge thereof will be withdrawn from the liquid in the valve casing but before this takes place the flange 33 at the top of the casing will enter the fluid in the channel at the top of the valve member so that the passageway between the valve casing and the opening 31 will be sealed. Thus the gas can pass from the inlet to the outlet of the casing but cannot escape therefrom. The stem 30 may be connected with the rod 24 in any suitable manner but in order that the rod may have an initial movement independently of the stem

I have secured to the lower end of the rod a yoke 34 having in the lower end thereof an opening 35 through which the stem 30 extends and the stem has mounted thereon a nut or other stop 36 which will be engaged by the bottom of the yoke as the rod 24 moves upwardly so that the stem will then be caused to move with the rod and the valve will be opened.

The operation of the mechanism will be readily understood from the foregoing description of the several parts thereof and it will be apparent that when the incinerator is in use the burner 7 will normally be operative, the pilot burner 9 only being lighted. When a predetermined quantity of garbage or other material has been deposited in the hopper the latter will be moved downwardly against the action of the counterbalancing weights, thus causing the levers to move about their axes and causing this movement to be transmitted through the rod 24 to the valve, thereby opening the valve and permitting the flow of gas to the burner. When the material within the hopper has been consumed or substantially consumed the weight on the hopper will be again reduced to such an extent that it will be overcome by the counterbalancing weights and the hopper thus moved to its elevated position and the valve closed.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In an incinerator comprising a casing, a burner near the lower end of said casing and a valve to control said burner, a hopper mounted for vertical movement in said casing, means for counterbalancing the weight of said hopper to support said hopper normally in an elevated position and to permit the same to be moved downwardly by the weight of material deposited therein, said counterbalancing means constituting the sole means for controlling the movement of said hopper, and means controlled by the movement of said hopper to actuate said valve, whereby said valve will be opened when said hopper is moved downwardly by the ma-

terial deposited therein and will be closed when said material has been substantially consumed and said hopper moved upwardly.

2. In an incinerator, a casing, a hopper mounted within said casing for vertical bodily movement, a plurality of supporting devices carried by said casing, spaced about the same and each having supporting connection with said hopper, counterbalancing means acting on said supporting devices to cause said hopper to be normally supported in an elevated position and to permit the same to move downwardly under the weight of material deposited therein, a burner associated with said hopper, and means controlled by the movement of said hopper to control the operation of said burner.

3. In an incinerator, a casing, a hopper mounted within said casing for vertical movement, a plurality of levers mounted on said casing, spaced about the same and having supporting connection with said hopper, counterbalancing devices connected with said levers to cause the same to yieldably support said hopper, a burner associated with said hopper, and means controlled by the movement of one of said levers about its axis for controlling the operation of said burner.

4. In an incinerator, a casing, a hopper mounted in said casing for vertical movement, a part carried by said casing and constituting a guide for said hopper, counterbalanced levers acting on said hopper to yieldably support the same within the casing, a burner associated with said hopper, and means controlled by the movement of said hopper to control the operation of said burner.

5. In an incinerator, a casing, a hopper mounted in said casing for vertical movement and having a cylindrical upper portion, a part carried by said casing and engaging said cylindrical part of said hopper to guide the same, a counterbalanced supporting device mounted on said casing and connected with said hopper to yieldably support the same, a burner associated with said hopper, and means controlled by the movement of said hopper to control the operation of said burner.

In testimony whereof, I affix my signature hereto.

WILLIAM C. EPSTEIN.