

W. E. SMITH.
HEAT DISTRIBUTING SYSTEM.
APPLICATION FILED MAR. 30, 1911.

1,020,933.

Patented Mar. 19, 1912.

2 SHEETS-SHEET 1.

Fig. 1.

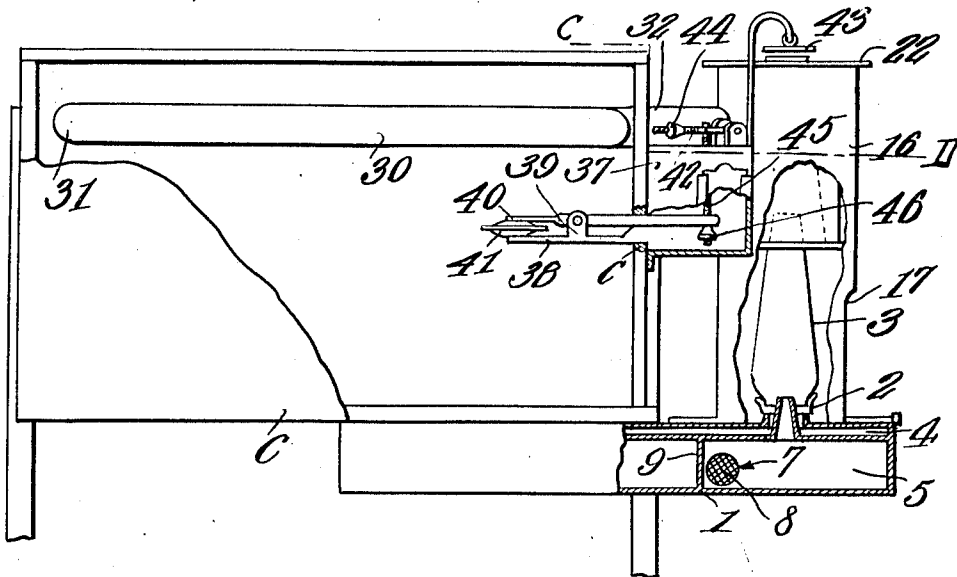
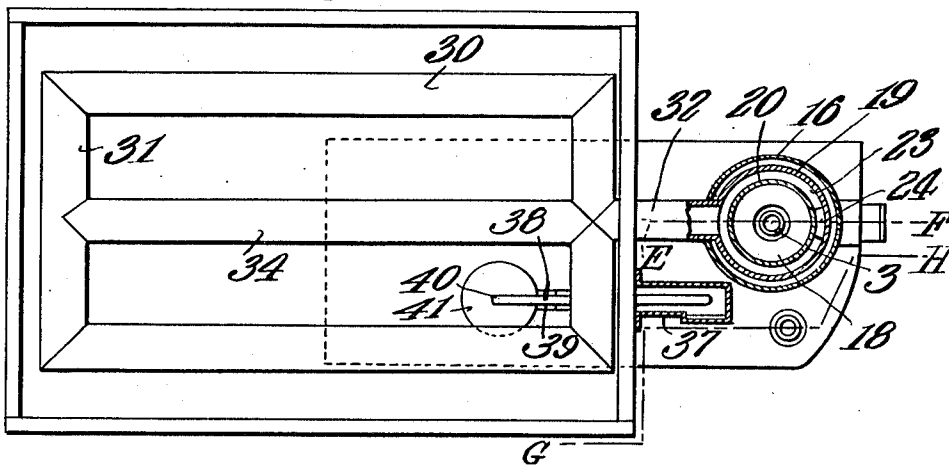


Fig. 2.



Witnesses

J. R. Dornier
L. H. Wilson

Walter E. Smith,
Inventor

by

C. A. Snow & Co.
Attorneys

W. E. SMITH.
HEAT DISTRIBUTING SYSTEM.
APPLICATION FILED MAR. 30, 1911.

1,020,933.

Patented Mar. 19, 1912.

2 SHEETS—SHEET 2.

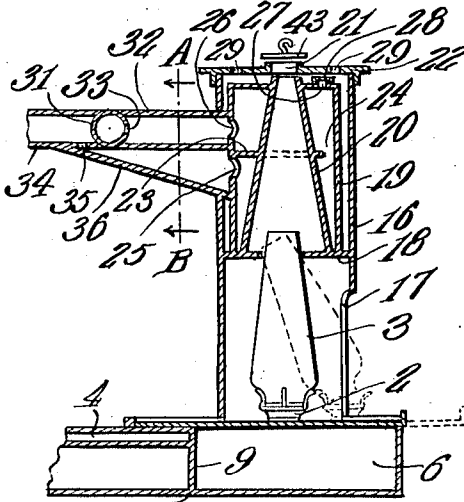


Fig. 3.

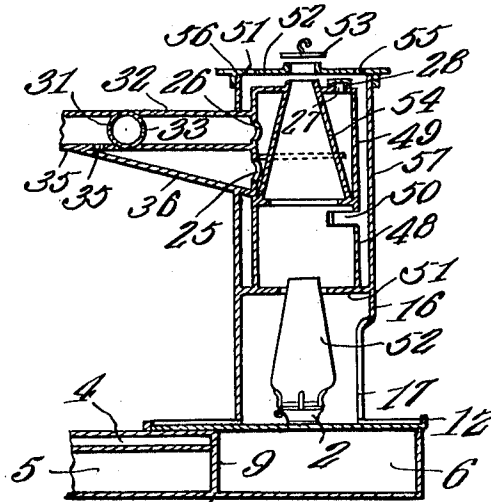


Fig. 6.

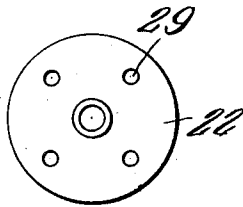


Fig. 5.

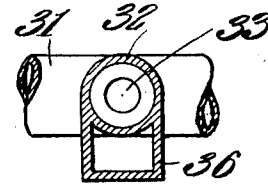


Fig. 4.

Witnesses

J. P. Tomlin
L. H. Wilson

Walter E. Smith,
Inventor

by *C. A. Snow & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

WALTER ERNEST SMITH, OF CLAY CENTER, KANSAS.

HEAT-DISTRIBUTING SYSTEM.

1,020,933.

Specification of Letters Patent. Patented Mar. 19, 1912.

Original application filed November 15, 1910, Serial No. 592,528. Divided and this application filed March 30, 1911. Serial No. 617,861.

To all whom it may concern:

Be it known that I, WALTER E. SMITH, a citizen of the United States, residing at Clay Center, in the county of Clay and State of Kansas, have invented a new and useful Heat-Distributing System, of which the following is a specification.

This invention relates to heat distributing systems and is a division of an application filed by me in the United States Patent Office on November 15, 1910, Serial No. 592,528.

The system is especially designed for use in connection with incubators and one of the objects of the invention is to provide a novel form of boiler and heat radiating tank, said tank being connected to the boiler in a novel manner whereby accidental displacement of one relative to the other is prevented.

With the foregoing and other objects in view which will appear as the description proceeds the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:—Figure 1 is a view partly in side elevation and partly in section of an incubator having the present improvements applied thereto, the section through the oil reservoir being indicated by the line G—H, Fig. 2. Fig. 2 is a horizontal section on the line C—D, Fig. 1 through the boiler and thermostat supporting casing, the top of the incubator being removed and the radiator or tank being shown in plan. Fig. 3 is a central vertical section through the boiler and through a portion of the radiator, said section being taken on the line E—F, Fig. 2. Fig. 4 is a section on line A—B, Fig. 3. Fig. 5 is a plan view of the housing, the damper being removed. Fig. 6 is a view similar to Fig. 3 but showing a slightly modified form of boiler.

Referring to the figures by characters of reference, C designates the casing of the incubator and one wall of the casing has a slot *c* for the reception of portions of the heat regulating mechanism.

An elongated casing 1 extends under and is secured to the casing C and constitutes an oil reservoir, there being a lamp burner 2 mounted on this casing and provided with a tiltable chimney 3, the burner being shiftable relative to the casing 1 as indicated by dotted lines in Fig. 3.

The casing 1 has an upper compartment 4 and a lower compartment 5, this last mentioned compartment constituting an oil reservoir while the upper compartment constitutes a receptacle for water. An elongated trough 6 is formed within the casing 1 and extends from the top to the bottom thereof, the interior of this trough being out of communication with the compartment 4 but communicating with the compartment 5 through one or more openings 7 each of which has a screen 8 designed to prevent the admission of dirt or other foreign substances to the trough 6 from the compartment 5. A reinforcing partition 9 may be arranged transversely within the casing 1.

Guide cleats 10 are formed on the top of casing 1 at opposite sides of the trough 6 and a slide 11 is mounted within them and constitutes a closure for the trough. Said slide has a finger piece 12 in one end and the burner 2 is pivotally connected to this slide.

A water inlet opening 14 is formed in the top of casing 1 and an oil inlet tube 15 extends through this opening and from the partition between the compartments 4 and 5. This opening and the tube are located at one side of the burner 2.

A cylindrical housing 16 is secured upon and extends upwardly from the casing 1 and has an opening 17 through which the chimney 3 is adapted to be partly drawn when the burner 2 is shifted as indicated by dotted lines in Fig. 3. A supporting ring 18 is secured within the housing 16 at a point above the opening 17. This ring constitutes the support of the cylindrical boiler 19 which is completely housed within the upper portion of the housing 16 and has a frusto-conical flue 20 centrally arranged therein, the upper or small end of the flue projecting above the top of the boiler and close to a central outlet opening 21 formed in the removable top 22 of the housing. A deflecting plate or partition 23 is arranged within the boiler and extends almost entirely around the flue 20, there being a passage 24

between the ends of this plate and which is located at a point remote from the inlet port 25 of the boiler. This inlet port is arranged below the plate 23 and an outlet port 26 is arranged above said plate and directly over the port 25. The boiler 19 is adapted to be filled through an orifice 27 which is formed in the top thereof and which is normally closed, as by means of a cap 28. The top or cover 22 of the housing 16 has a series of small openings 29 adjacent the periphery thereof. These openings are located above the space which is formed between the housing and the boiler.

The radiator used in connection with the boiler is adapted to be supported within the upper portion of the casing C and consists of a rectangular frame made up of communicating side and end pipes 30 and 31, respectively. An outlet tube 32 extends from the boiler 19 and opens thereinto through the outlet port 26, this pipe extending, and being soldered or otherwise secured to the middle portion of one of the end pipes 31, said end pipe having an opening 33 through which communication is established between said pipes 31 and 32. A return pipe 34 is interposed between and secured to the middle portions of the two end pipes 31 and communicates, at one end, with the interior of that pipe 31 which is remote from the pipe 32. The other end of pipe 34 is closed. There is, however, an outlet opening 35 in the bottom of pipe 34 close to the closed end thereof, and a box-like extension 36 is arranged under and secured to the pipes 32 and 34 and opens into the port 25 and the aperture 35. It will be apparent, from the foregoing, that hot water upon leaving the boiler through the port 26, will flow, by way of pipe 32, to the near pipe 31 and thence in both directions through the said pipe to the side pipe 30 and the remote pipes 31 from which it will return, through pipe 34 to box 36 and thence through port 25 to the bottom portion of the boiler. Importance is attached to the fact that the extension or box 36 projects under the pipe 31 in which the opening 33 is formed, this extension thus not only constituting part of the return pipe of the radiator, but also serving to brace the radiator at its weakest point, to wit, where the three pipes 32, 31 and 34 are soldered together.

A box-like casing 37 is secured to the slotted wall of the casing C and extends across the slot, this housing or casing 37 having an arm 38 extending therefrom and through the slot c. Said arm has one or more ears 39 projecting upwardly therefrom and supporting a lever 40. A thermostat wafer 41 is interposed between and secured to the ends of arms 38 and lever 40 and said lever projects through the slot c and into the casing 37. A damper lever 42 is fulcrumed upon

the top of casing 37 and carries a damper 43 at one end, while its other end is screw-threaded and has a weight 44 adjustable thereon. A screw-threaded rod 45 is pivotally connected to the lever 42 at a point between its fulcrum and the weight 44 and projects downwardly into casing 37 and loosely engages the lever 40, there being an adjustable device, such as a nut 46, engaging the rod 45 and constituting a support for the lever.

It is to be understood that, under normal conditions, the wafer 41 is collapsed and the damper 43 is resting on the top 22 so as to close the opening 21. After the casing 1 has been filled and water has been poured into the boiler 19 through the opening 27, the wick of the burner is ignited and the chimney 3 is inserted into the ring 18. The products of combustion, after leaving the chimney 3 will pass upwardly through the flue 20 and will be spread horizontally by the cover 22, a portion of these products passing around the boiler and between it and the housing and all of the products finally escaping through the outlet openings 29. The boiler will thus be heated both along the flue and along its exterior surfaces and the temperature of the water contained therein will soon be raised to a desired degree. The water, upon being heated, will circulate from the boiler, through the radiator and back into the inlet port 25, the direct upward movement of the water from this port 25 to the port 26 being prevented by the deflecting plate or partition 23. When the temperature within the casing C rises to a predetermined degree, the wafer 41 will be expanded to such an extent as to cause the lever 40 to pull downwardly on lever 42 and therefore lift the damper 43 off of the top 22. The products of combustion will therefore be free to pass directly from the chimney 3 and flue 20 to the outlet opening 21 and the water contained within the boiler and radiator will therefore quickly cool so as to reduce the temperature of the air confined within the casing C.

Attention is directed to the fact that the thermostat and all of the parts operated thereby and connected thereto are supported by the casing 37 which is arranged outside of casing C. By mounting all of these controlling parts upon the one object, they are not affected by changes in temperature as is often the case where, for example, the arm supporting the thermostat is attached to a wall of casing C, while the lever operated by said thermostat is attached to another structure. The difference in expansion of the two parts due to the fact that they are exposed to different temperatures, often results in the actuation of the damper when such actuation is not desired.

In Fig. 6 has been shown a heater which

differs slightly from that shown in the other figures of the drawing. This heater has a drum 48 extending downwardly from the boiler 49 and provided, close to the bottom of the boiler, with an outlet 50 for the products of combustion. A flange 51 extends inwardly from the bottom portion of this drum and surrounds the upper end of the chimney 52. In this form of device, when the damper 53 is closed, the products of combustion, instead of passing upwardly through the conical flue 54, will pass outwardly through the port 50 and thence along the outer side of the boiler to the outlet openings 55 in the top 56 of the housing 57. In other respects this modified form of heater is the same as the heater heretofore described.

What is claimed is:—

1. In a heater, a boiler having an inlet port and an outlet port, a radiator consisting of communicating side and end tubes, a distributing tube extending from the outlet port to one of the end tubes and opening into said end tube, a return tube extending between and secured to the end tubes and opening into the other one of said end tubes, and a hollow reinforcing extension secured

under the meeting portions of the distributing tube, the return tube and end tube, said extension communicating with the return tube and with the interior of the boiler through the inlet port.

2. In a heater, the combination with a boiler having an outlet port and an inlet port, of a radiator consisting of communicating side and end tubes, one of said end tubes having an opening, a distributing tube connecting the apertured end tube with the outlet port, a return tube extending from the other end tube and secured between both of said tubes and in alinement with the distributing tube, and a hollow reinforcing extension secured to the distributing and return tubes and establishing communication between said return tube and the inlet port, said extension projecting transversely under the apertured end tube.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WALTER ERNEST SMITH.

Witnesses:

JOHN McKEE,
G. B. McKEE.