

L. N. PORTER.
HEATING APPARATUS FOR INCUBATORS.
APPLICATION FILED SEPT. 30, 1911.

1,047,444.

Patented Dec. 17, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

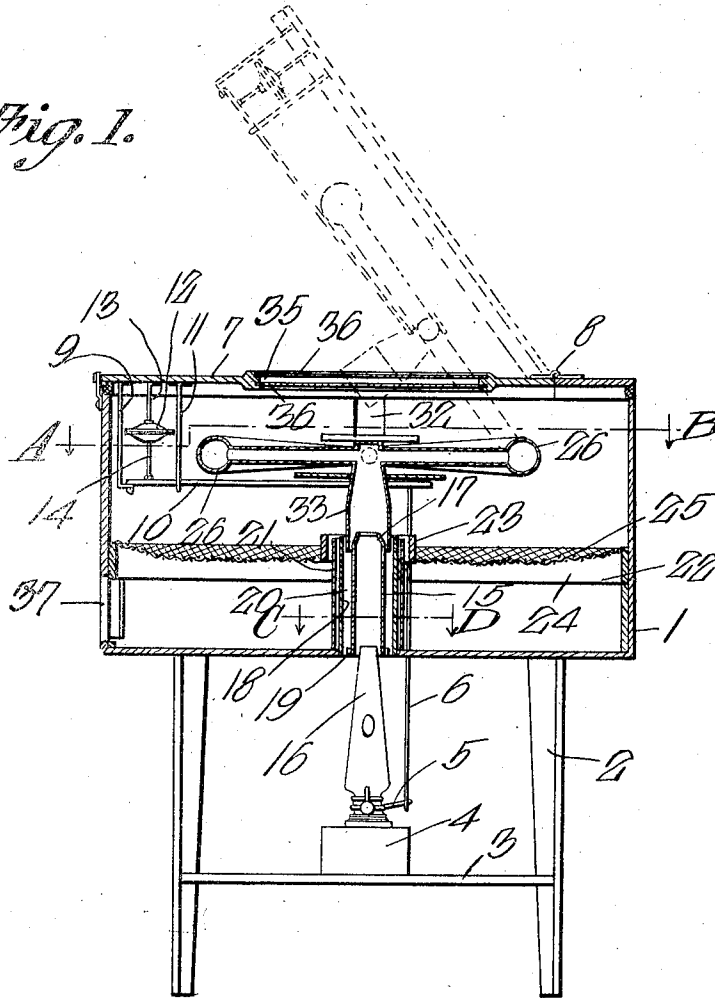
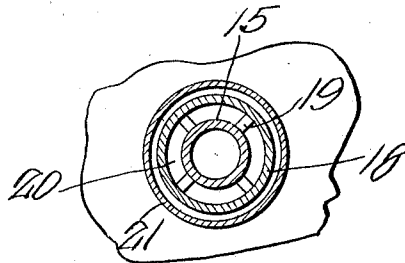


Fig. 3.



Witnesses

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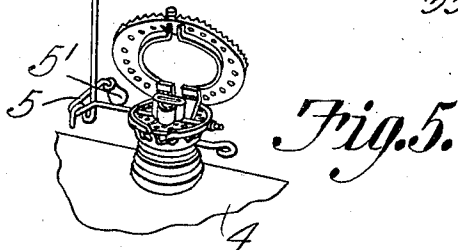
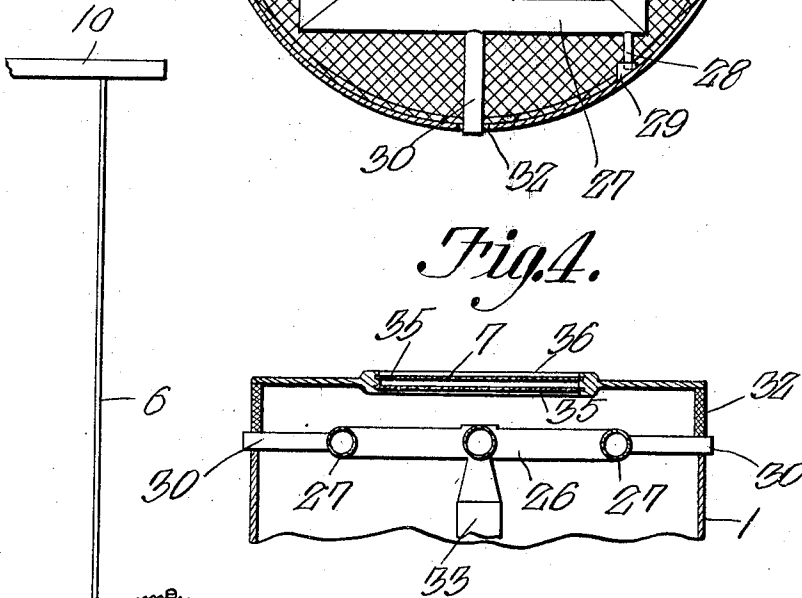
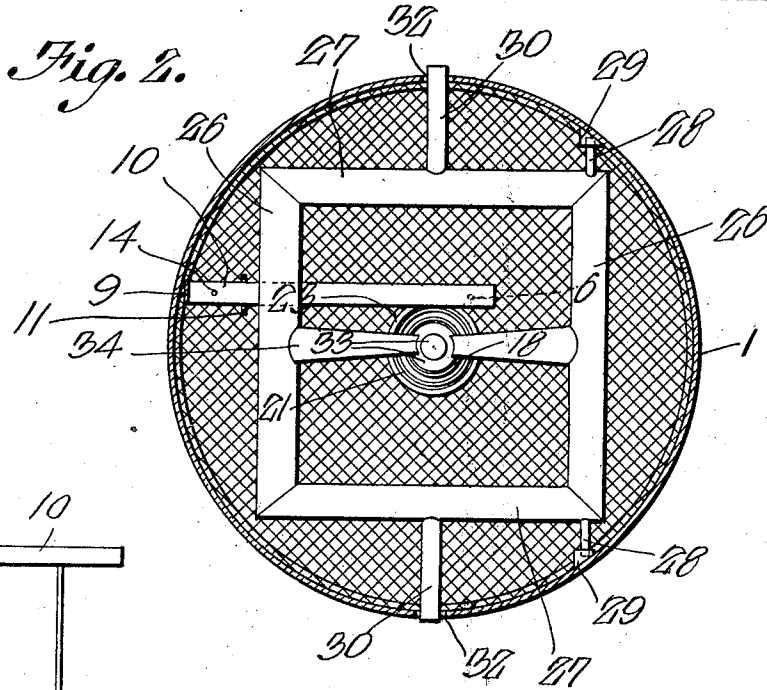
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2 SHEETS-SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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HEATING APPARATUS FOR INCUBATORS.

1,047,444.

Specification of Letters Patent.

Patented Dec. 17, 1912.

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To all whom it may concern:

Be it known that I, LOUIS N. PORTER, a citizen of the United States, residing at Blair, in the county of Washington and State of Nebraska, have invented a new and useful Heating Apparatus for Incubators, of which the following is a specification.

This invention relates to incubators and more particularly to means for heating the same.

One of the objects of the invention is to provide a radiator which is movably mounted within the body of the incubator and is adapted to swing upwardly with the incubator top or lid or when the same is opened, there being a regulator upon the lower or inner face of the lid and which includes a lever constituting means not only for shifting the flame regulator but also means for holding the radiator so that it will move upwardly out of the way when the lid or top is swung open.

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, 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 central vertical section through the incubator, one of the positions of the radiator and the incubator top being indicated by dotted lines. Fig. 2 is a section on line A—B Fig. 1. Fig. 3 is an enlarged section on line C—D Fig. 1. Fig. 4 is a central transverse section through the radiator and showing the adjacent portions of the wall of the incubator. Fig. 5 is a perspective view of a portion of the heater and its regulating mechanism.

Referring to the figures by characters of reference 1 designates an incubator casing mounted on suitable supports 2, this casing being preferably cylindrical, although it is to be understood that the same can be of any other form desired. A shelf 3 is preferably arranged below the casing 1 and supports a heating lamp 4 provided with any suitable flame regulating means indicated generally

at 5, said means being under the control of a rod 6 which extends upwardly into the casing 1. Said regulating means includes an arm having a weight 5' at one end whereby said arm is held with its other end normally elevated, as shown in Fig. 1. This elevated end is adapted to be engaged and depressed by the rod 6. Inasmuch as this regulating means constitutes no part of the present invention it is not deemed necessary further to describe and illustrate the same in detail.

The incubator casing has a top or cover 7 hingedly connected thereto, as at 8 and a hanger 9 extends downwardly from this cover adjacent the front thereof and has a lever 10 pivotally connected to it. Said lever is held normally substantially parallel with the top 7, a supporting and guiding loop 11 being provided for this purpose. Said loop extends from the top 7 and is fixedly connected to it. A thermostat 12 is preferably connected to the cover 7 by means of a hanger 13 fixedly attached to said cover or top and a rod 14 connects said thermostat to the lever 10 so that, when the thermostat is expanded the rod 14 will press downwardly on lever 10 whereas, when the thermostat contracts, it will lift the lever 10. It is to be understood that under normal conditions the lever 10 is out of contact with the loop 11. Lever 10 normally bears upon the upper end of the rod 6 so that, when said lever is pushed downwardly by the expanding thermostat, rod 6 will also be pushed downwardly and will operate the flame controlling means 5 so as to reduce the size of the flame and correspondingly diminish the heat given off by the lamp. A feed tube 15 extends upwardly into the casing from the bottom thereof and the lower end of this tube receives the upper end of the lamp chimney 16. The upper end of the tube is preferably rounded, as indicated at 17.

An air supply tube 18 extends around and is concentric with the feed tube 15, there being arms 19 within the lower end of the tube 18 and which serve to support the feed tube 15 fixedly in position. Tube 18 extends throughout the height of the tube 15 and an annular air passage 20 is thus formed between the two tubes. An outer tube 21 surrounds and is spaced from tube 18, thus forming an air jacket about the tube 18.

An egg tray 22 is mounted within the

casing 1 and has a central opening through which the tubes 15, 18, and 21 project. A flange 23 preferably extends upwardly from the tray 22 and around the central opening. This flange is spaced from the tube 21, as shown particularly in Fig. 1. The egg tray can be of any preferred construction and in the drawings it has been shown made up of a ring 24 having a concave, coarse wire fabric 25 secured thereon.

A radiator is mounted within the upper portion of the casing 1 and is preferably rectangular, as indicated in Fig. 2, said radiator consisting of front and rear tubes 26 and side tubes 27, the ends of the tubes 26 opening into the ends of the tubes 27 and all of the said tubes being fixedly connected so as to form a rigid structure. Trunnions 28 extend from the rear corner portions of the radiator and are journaled within brackets 29 secured upon the inner surface of the wall of the casing 1.

Outlet tubes 30 extend laterally from the centers of the side tubes 27 and are of less diameter than said tubes 27, these outlet tubes normally resting in notches or slots 32 formed in the wall of casing 1 at diametrically opposed points. These slots 32 extend into said wall from the upper end thereof and are adapted to be closed by the lid or cover 7. The tubes 30 do not completely fill the slots 32 but, instead, sufficient spaces are formed above and around said tubes to permit vitiated air to freely escape therethrough. This has been clearly shown in Fig. 4.

A hood 33 is arranged at the center of the radiator and the upper portion of this hood is connected to the center portions of the front and back tubes 26, by tubes 34 which are integral with the hood and with the tubes 26. Said tubes 34 are tapered toward the hood and the inlet ends thereof are considerably less in diameter than the tubes 26. These connecting tubes 34 serve to support the hood 33 fixed relative to the tubes 26 and 27 and the lower or open end of the hood normally extends around the reduced or tapered end 17 of the tube 15. When the radiator is in its normal position, as indicated in Fig. 1, the lever 10 extends thereunder but out of contact therewith.

The top or cover 7 is preferably provided with an opening 35 closed by spaced plates 36 of glass whereby the contents of the incubator can be readily viewed at all times. A door 37 may be provided in the lower portion of casing 1 so that access may be had conveniently to the interior of the casing below the tray 22.

It will be obvious that when the parts are assembled as indicated in Fig. 1, the heat arising from the lamp chimney 16 will pass into the tube 15, and thence into hood 33. From this hood the hot gases will flow into

the tapered tubes 34 and will circulate through tubes 26 and 27 to the reduced tubes 30 from which they will be discharged into the external atmosphere. By providing tubes 26 and 27 having their diameters greater than the diameters of the tubes 30 and of the inlet ends of tubes 34, the circulation of the hot gases within the tubes 26 and 27 is retarded and the efficiency of the radiator thus materially increased. Fresh air is free to flow upwardly into the casing 1 between the tubes 15 and 18 and, during its movement through passage 20, will be heated by the tube 15. When it is desired to turn the eggs, the top or cover 7 may be swung open and lever 10 will thus be brought into contact with the radiator and will be swung downwardly until stopped by the loop 11. Said lever will then operate to swing the radiator upwardly about the axis of the trunnions 28, thus lifting the tubes 30 out of the slots 32. The radiator will thus be moved out of the way of the operator and the eggs can be conveniently reached. By lowering the cover 7 to closed position, the radiator will be guided back to its initial position, hood 33 moving into engagement with the upper end of the tube 15 and lever 10 reassuming its position upon the upper end of rod 6. When the lever is in this position it is supported out of contact both with the radiator and with the loop 11. The actuation of the lever by the thermostat 12 will not, therefore, be interfered with.

Instead of depending upon the thermostatically controlled parts for lifting the radiator when the top of the incubator is raised, any suitable hanger may be extended downwardly from the top 7 and engage the radiator so as to insure the upward movement thereof when the cover is raised.

What is claimed is:—

1. In an incubator, the combination with a casing, a heater, flame controlling means, and means for conducting heated air into the casing from the heater, of a closure movably connected to the casing, a thermostat supported thereby and movable therewith, and means shiftable with the thermostat into and out of engagement with the flame controlling means of the heater during the closing and opening respectively of the closure, for regulating the heat.

2. In an incubator the combination with a casing, a heater having flame controlling means, and means for conducting hot air from the heater and into the incubator casing, of a hinged closure, a thermostat supported by and movable with the closure, a lever supported upon and movable with the closure and adapted to be actuated by the thermostat, and means for transmitting motion from said lever to the flame regulating means of the heater, said lever being mov-

able out of and into engagement with said means during the opening and closing of the closure respectively.

3. In an incubator, the combination with
5 a casing and a heat conducting tube extending
thereinto, of a radiator including a hood
removably engaging said tube, outlet tubes,
and trunnions, said trunnions pivotally en-
10 gaging the casing and the outlet tubes de-
tachably engaging the casing, said outlet
tubes and trunnions cooperating to hold the
radiator normally in position with its hood
engaging the heat conducting tube, a hinged
cover, a thermostatically controlled lever
15 connected thereto and extending under the
radiator, flame controlling means actuated
by the lever, means for limiting the move-
ment of the lever relative to the cover, said
lever constituting means for engaging the
20 radiator to swing it upwardly when the
cover is opened.

4. In an incubator, the combination with
a casing and a heat conducting tube extend-
ing thereinto, of a pivoted radiator within
the casing, said radiator normally commu- 25
nicating with the tube, a hinged cover, a
thermostatically controlled lever connected
to and movable with the cover, said lever
extending under the radiator, flame control-
ling means actuated by the lever, and means 30
for limiting the movement of the lever away
from the cover, said lever operating to en-
gage and elevate the radiator when the cover
is raised.

In testimony that I claim the foregoing as 35
my own, I have hereto affixed my signature
in the presence of two witnesses.

LOUIS NATHAN PORTER.

Witnesses:

OSCAR DIXON,
JESSIE L. DIXON.