

No. 660,583.

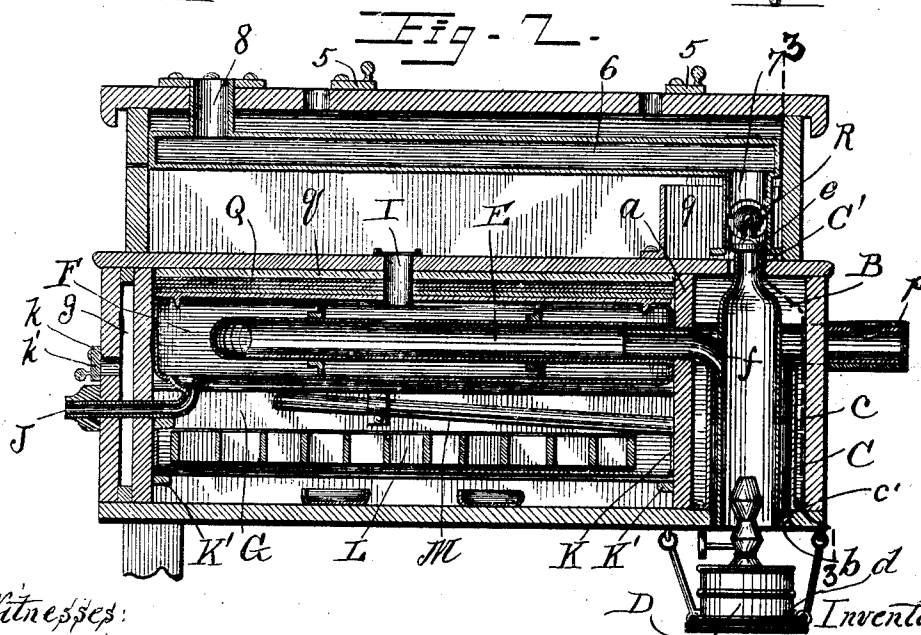
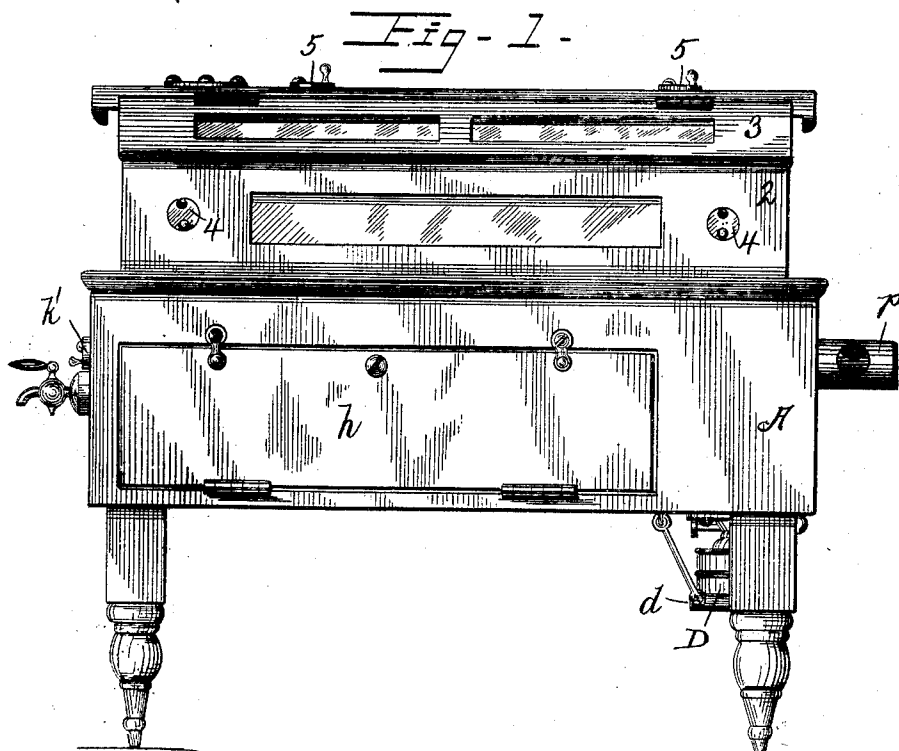
J. W. & C. A. MYERS.
INCUBATOR.

Patented Oct. 30, 1900.

(Application filed July 6, 1897.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:
R. J. Jacker,
J. S. Chubb.

Inventors:
John W. Myers &
Clarence A. Myers
By Frank D. Thompson

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J. W. & C. A. MYERS.

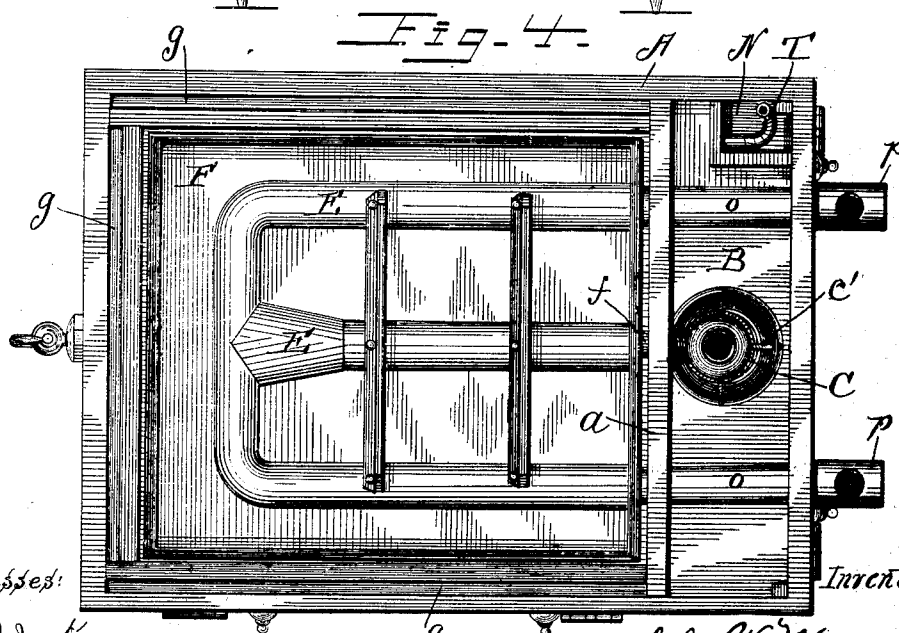
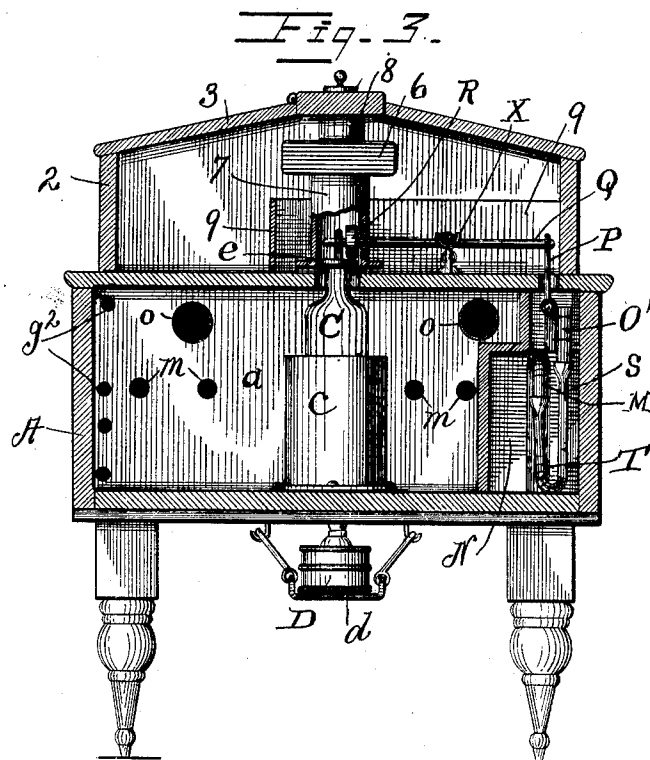
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(No Model.)

3 Sheets—Sheet 3.



Witnesses:

R. J. Jackson
J. S. Chubb

Inventors:

John W. Myers and
Clarence A. Myers
By Frank D. Thompson atty

UNITED STATES PATENT OFFICE

JOHN W. MYERS AND CLARENCE A. MYERS, OF QUINCY, ILLINOIS.

INCUBATOR.

SPECIFICATION forming part of Letters Patent No. 660,583, dated October 30, 1900.

Application filed July 6, 1897. Serial No. 643,512. (No model.)

To all whom it may concern:

Be it known that we, JOHN W. MYERS and CLARENCE A. MYERS, citizens of the United States, and residents of Quincy, Adams county, Illinois, have invented certain new and useful Improvements in Incubators, of which the following is a specification.

The object of our invention is to furnish an incubator the hatching-chamber of which will, during the time it is in operation, be supplied with warm pure air which will not be contaminated by commingling with the products of combustion of the heat generating or distributing devices nor sterilized by being burned, into which the cold outside atmosphere cannot find immediate or direct access and the inclosing walls of which will always be warm, so as to maintain an even temperature throughout the same, and thus prevent the eggs placed near the outside edges of the egg-tray being cooler than those nearer the center thereof, and which is provided with a simply-heated and safe superimposed detachable brooder for the care of the young chicks. This we accomplish by providing the incubator with an initial air-chamber, into which the outside atmosphere is first drawn and warmed by coming in contact with the inclosing walls of the heat receiving and distributing devices, by providing double walls on all sides of the hatching-chamber except that separating it from the said initial air-chamber, so as to provide a continuous warm-air space that takes its warm-air current from said initial air-chamber and discharges the same from the outer of the double walls opposite the same, by providing inlet air-openings into the hatching-chamber in the wall between it and said initial air-chamber and providing outlet-openings in the opposite end walls thereof, and by utilizing the excess of heated products of combustion and directing them through the superimposed brooder, substantially as hereinafter described fully, and as illustrated in the drawings, in which—

Figure 1 is a front elevation of our improved incubator. Fig. 2 is a vertical central longitudinal section therethrough. Fig. 3 is a transverse vertical section therethrough, taken on line 3 3 of Fig. 2. Fig. 4 is a plan view of the same with the brooder and top of

the same removed. Fig. 5 is a horizontal section through the same, taken on a plan just below the hot-water tank.

In the drawings, A represents the oblong box-shaped case of the incubator, which has one end partitioned off by a vertical transverse wall *a*, so as to provide the initial warm-air compartment B. In the floor of this compartment is a round or other shaped opening *b*, and secured to the margins of this opening *b* is a shaft or air-duct *c* to conduct the air up around the heated sides of a heat-receiver C into said compartment B at a point preferably near the top of the same. This heat-receiver C is of a less diameter than said shaft *c*, and it is held or suspended concentrically therein by means of straps *c' c'* at the bottom, (and top also, if desired,) connecting it to said shaft. The heat-receiver receives the heated products of the lamp D, supported by the suspended platform *d* below the floor of said compartment, and the upper end C' of this receiver extends through a suitable opening in the top of said compartment and is opened and closed by a damper-plate *e*, forming a part of the heat-regulating devices of the incubator, as will hereinafter be more fully described. This heat-receiver is at a point just above the upper open end of shaft *c* provided with an offset or elbow *f*, which extends horizontally to and through the wall *a* and enters and discharges the heated products of combustion when the discharge end C' of the heat-receiver is closed into the central branch of the hot-air pipe E of the hot-water tank F, to which more extended reference will be had hereinafter.

The remaining portion of case A, exclusive of that devoted to the initial warm-air compartment, is devoted to the hatching-chamber G. This hatching-chamber is inclosed in front and back and at the end opposite the partition-wall *a* by double walls, and the spaces *g* between these double walls communicate with chamber B, and thus, together with said chamber B, form a circumambient warm-air envelop for said hatching-chamber. The space *g* between the rear double walls of the hatching-chamber communicates with chamber B by means of the aperture *g'* in the rear end of partition *a* and the space between the double walls in front of said hatching-

chamber communicates with chamber B by means of apertures g^2 in the forward end of partition a . The inner and outer walls in front of the hatching-chamber are each provided with coinciding doors i and h , respectively, which are provided with suitable catches for holding them closed, and each of which corresponds in length to that of the hatching-chamber; but the inner door is slightly less in height than the outer door, so that when open it clears the jamb of the former and has a glass pane therein, so that a view of the interior of the hatching-chamber can be had without opening the same whenever desired. The air-space between these two doors communicates, as stated, with chamber B through the apertures g^2 , and at its opposite end it communicates with the space between the double walls by apertures h' in the forward end of the inner of said walls. A continuous current of warm air through space g from chamber B is made possible by an exhaust-opening k , located in the outer of the double walls opposite partition a . This opening is regulated by a disk k' , pivoted at one side of said opening k and is manipulated by hand.

In order to ventilate the hatching-chamber we provide the partition a at a point above the egg-tray and below the hot-water tank with a horizontally-arranged series of air-inlet openings $m m$, and in the inner of the opposite double wall we provide a series of air-vents $n n$ below the egg-tray. Thus when the exhaust-opening k is opened the warm air from chamber B circulates through the space g and through the hatching-chamber, warming the former and ventilating the latter without permitting any cold drafts coming in contact with the eggs at all.

The hatching-chamber is heated by means of a hot-water tank F, located in the top thereof. The length and breadth of this tank correspond to that of said hatching-chamber, and its depth or thickness corresponds to about one-quarter the height of said chamber, and its edges rest upon suitable cleats or ledges, whereby it is supported and made to occupy the top portion of the hatching-chamber. This tank is provided with a supply-pipe I, which leads up therefrom through the top of the incubator proper, and has a suitable slide or valve for closing the same and is also provided with a suitable drain-pipe J, which leads from its bottom near the end opposite the chamber B and is then bent laterally and extends out through the double walls and has its extremity provided with a suitable cock to control the outflow. The tank is heated by an M-shaped hot-air pipe E, the central of the three parallel branches of which is in alinement with the elbow f of the heat-receiver and is detachably connected therewith and receives the heated products of combustion therefrom, as hereinbefore stated. The ends of the two outer parallel branches of this M-pipe next the partition a extend

through the end of the tank and are detachably connected to sections of pipe $o o$, which extend through suitable openings in said partition a , through the initial warm-air chamber, and to and through the outer wall thereof. The outer ends of these detachable extensions $o o$ are provided with a suitable discharge-opening in their sides, and they are each covered by a suitable thimble $p p$, having a corresponding opening therein. By turning these thimbles the discharge from said extensions can be controlled as desired. We do not wish to confine ourselves to the use of thimbles p for this purpose, however, as it is obvious other well-known devices could be resorted to for accomplishing the same result.

We prefer to place on top of the tank several thicknesses of non-conducting material Q, such as paper, and, if desired, to place over this non-conducting material a wood cover q . These, while desirable, can be dispensed with, however.

Located two or three inches below the tank F is an egg-tray K, which corresponds in length to that of the hatching-chamber, but is slightly less in width than the same and which rests and moves on horizontal ledges K' such a distance above the bottom of the hatching-chamber that water-pans can be easily placed under same. The bottom of the egg-tray is preferably made of wire-netting, so as to be perforate, and placed within the sides of the same is a rectangular egg-turning frame L, which is about the same in width as the space inclosed within the sides of said egg-tray, but is of a less length, so that it can be moved by hand longitudinally therein. This frame is provided with a series of transverse parallel slats O therein which are placed such distance apart that eggs may be placed in the tray between them and when said frame is moved longitudinally be turned on their sides. We do not desire to be considered as claiming anything new at this time in the construction of this egg-tray. It is simply referred to as a necessary element of our complete incubator. It is desirable to always keep the hatching-chamber at an even temperature. This is accomplished by means of a heat-regulating device consisting of a horizontally-disposed tube M, secured to the rear wall of the hatching-chamber between the egg-tray and tank, one end of which extends through a suitable opening in partition a into a compartment N in the rear of and suitably partitioned off from the initial warm-air chamber B, which compartment extends horizontally from the partition a to near the outer wall of the chamber B and then extends vertically as a flue to the top of the incubator, in which a hole is made for the passage of a link P therethrough. The temperature of compartment N is always nearly normal—that is, 15° to 20° Fahrenheit below that of the hatching-chamber G or chamber B—and the end of tube M, extending into the horizontal part of this compartment, terminates in a

downward bend. The extremity of this bend has attached to and leading therefrom a flexible rubber tube T, which sags downward slightly from its lower attached end and then upward in the flue part of the compartment N and has its upper end attached to a tubular terminus, clipped to a block O', to which the lower end of the link P is pivotally secured, as shown. The upper end of link P is pivotally secured to the rear end of a walking-beam or lever Q', which is fulcrumed about its center of length in the arms of the crescent-shaped upper end of a standard X, secured to the top of the incubator. The forward portion of the lever Q' is screw-threaded and has a centrally-tapped weight R, adjustable longitudinally thereon, and the forward extremity of said lever has the damper-plate e suspended therefrom, as shown. In operation the horizontal part of tube M is entirely filled, so as to exclude the air, with some fluid, such as alcohol, that will expand and contract, according to the degree of heat to which it is subjected, and its bent end in compartment N is filled with mercury or a like heavy mineral. Now when the heat in the hatching-chamber is above the desired degree the expansion of the alcohol in the tube M forces the mercury into the flexible tube T, and this tube, weighing down on the rear end of lever Q', moves it downward and lifts the damper-plate e from the direct draft or exit of the heat-receiver C and permits the products of combustion to discharge therefrom instead of into the M-shaped hot-air pipes of the tank. The heated products of combustion continue to discharge from the upper end C' of the heat-receiver until the temperature has fallen in the hatching-chamber and the alcohol in tube M contracted sufficient to permit enough of the mercury to gravitate back from tube T into the bend of tube M to lighten it and permit the weighted damper-plate suspending end of lever Q' to lower and again close end C' of the heat-receiver.

The brooder 2 is a floorless gable-shaped roofed shed of suitable dimensions having glass-covered openings in its top and sides, having one of the sides of its gabled roof hinged in such manner as to form a door 3, through which access can be had to its interior, and having slide-covered air-vents in its sides 4 4 and its top 5 5 to insure its perfect ventilation. This brooder is placed centrally on the flat top of the incubator and over the end C' of the heat-receiver C and over the lever Q'. Extending longitudinally the entire length of this brooder and secured to the ends of the same on a plane slightly below the ridge

of its roof is a hot-air drum 6, which is provided with a downwardly-depending intake-pipe 7 at one end, whose lower open mouth passes over and surrounds the exit end C' of said heat-receiver. On one side of this intake-pipe we provide a suitable hole for the adjacent end of lever Q' to pass through. The end of the hot-air drum opposite that from which intake-pipe 7 depends has an outlet-pipe 8, that projects through the roof of the brooder and discharges entirely out of the same. The lever Q' and the intake-pipe 7 are entirely inclosed by a suitable fence 9 around the same, so that when the young chicks are in the brooder they cannot interfere with or be injured by the same. This hot-air drum keeps the brooder at about an even temperature—somewhat less than that in the incubator—all the time, and being near the ridge of the roof it is too high for the young chicks to come in contact therewith, and yet it permits of cloths or towels being hung over the same, so that on cold nights the chicks can hover under the same.

If desired, the tank F can be dispensed with and the machine converted into a hot-air incubator simply by employing the same M-shaped hot-air pipe, constructed in every substantial respect like that in the said tank, but sustained by clips from the ceiling of the hatching-chamber.

When used as a hot-air incubator, more moisture should be provided for the hatching-chamber in any of the well-known ways.

What we claim as new is—

1. In an incubator, a heater, a heat-circulating system extending therefrom having exit-openings controlled by outside dampers p, whereby the circulation through such system taken from the said heater may be controlled, and another circulating system controlled by a thermostat actuated by changes of heat in the first-mentioned system.

2. In an incubator, having a hatching-chamber and a brooder, a heater, a heat-circulating system for the hatching-chamber extending from the heater and provided with exit-openings controlled by external hand-operated dampers, a heating system for the brooder extending from said heater having heat-ingress openings controlled by a damper, and automatic means arranged in the hatching-chamber for controlling said damper.

JOHN W. MYERS.
CLARENCE A. MYERS.

Witnesses:

B. G. VASEN,
FRANK D. THOMASON.