J. D. GRAVES.

ELECTRICAL INCUBATOR.

APPLICATION FILED JUNE 30, 1916.

1,213,353. Patented Jan. 23, 1917.

Fig. 1.

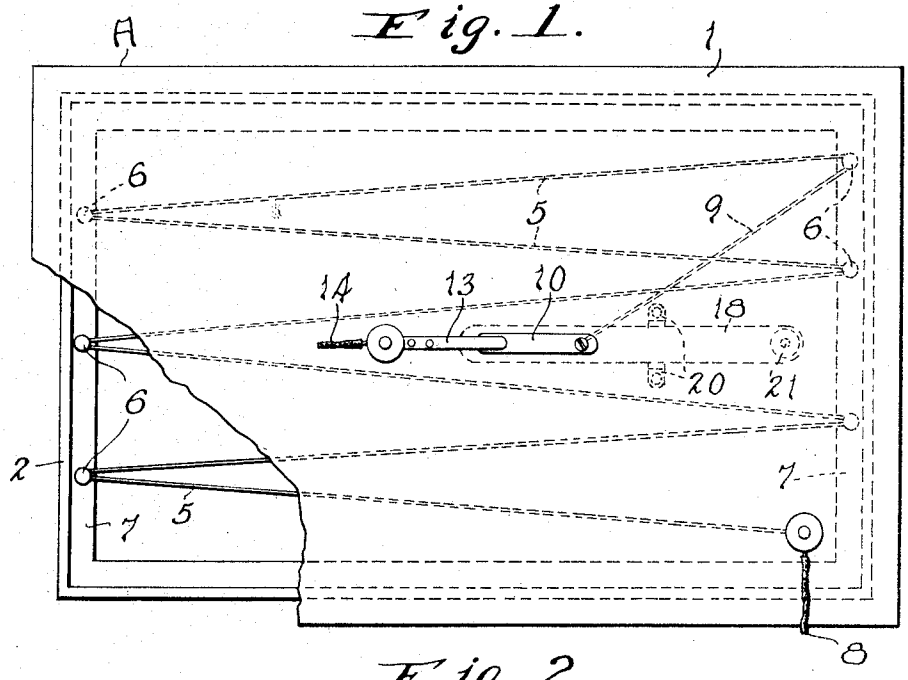
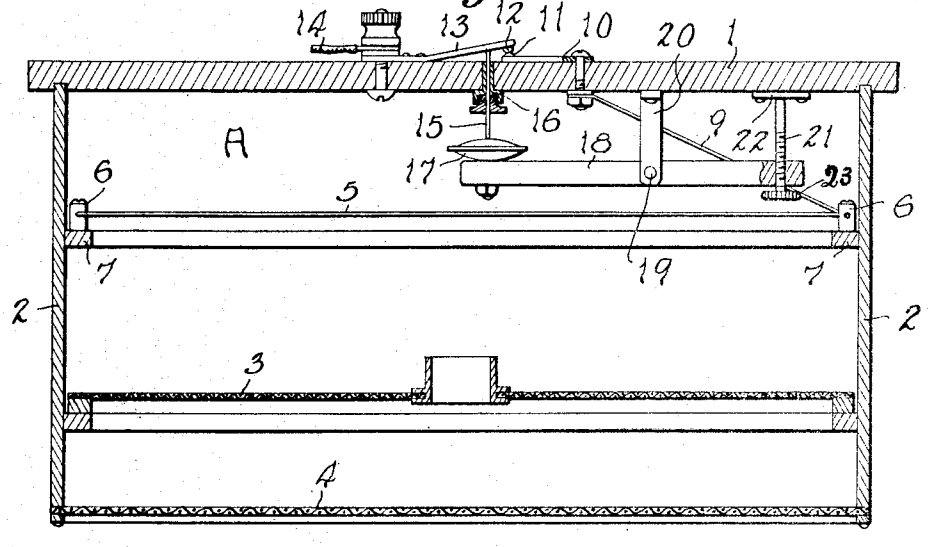


Fig. 2.



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ELECTRICAL INCUBATOR.

1,213,353. Specification of Letters Patent. Patented Jan. 23, 1917.

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To all whom it may concern:

Be it known that I, JOHN DAVID GRAVES, a citizen of the United States, residing at Colton, in the county of San Bernardino, State of California, have invented a new and useful Electrical Incubator; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to an electrically heated incubator, and has for its object to provide an incubator which embodies novel features of construction whereby the heat is uniformly distributed over the top of the eggs and the temperature is under perfect control.

Further objects of the invention are to provide an electrically heated incubator which is comparatively simple and inexpensive in its construction, which is very sensitive and provides for a perfect control of the heat within the incubator, which is thoroughly dependable in its operation, and which can be easily adjusted for the accurate maintainance of any necessary temperature.

With these and other objects in view, the invention consists in certain novel combinations and arrangements of the parts as will more fully appear as the description proceeds, the novel features thereof being pointed out in the appended claims.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawing, in which:—

Figure 1 is a top plan view of an electrically heated incubator constructed in accordance with the invention, one corner of the top being broken away. Fig. 2 is a longitudinal vertical sectional view through the same.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

For the purpose of illustration the invention is shown as embodied in an incubator box A which may be formed of any suitable material and includes the top 1 and sides 2, said box being adapted to be supported in an elevated position in any suitable manner.

The numeral 3 designates a conventional egg tray, and 4 a sheet of reticulated material such as burlap or screening, which is stretched across the otherwise open bottom of the box. Proper ventilation is thus provided within the box, and carbonic acid gas, which is heavier than air, will descend and escape through the bottom.

A resistance wire 5 is stretched back and forth horizontally within the top of the box A said resistance wire being disposed above the eggs and extending over substantially the entire area of the box so as to obtain an even distribution of the heat. This resistance wire 5 may be supported in any suitable manner, being shown in the present instance as zigzagged back and forth between insulators 6 which are applied to a horizontal ledge or strip 7 extending around the inner faces of the sides 2 at a point spaced from the top 1. One end of the resistance wire 5 is connected to a feed wire 8, while the opposite end thereof is connected by a conductor 9 to a contact bar 10 mounted upon the top of the box, said bar having a metallic contact 11 at one end thereof. This contact 11 is normally engaged by a metallic contact 12 at the free end of a swinging arm 13 which is connected to the other feed wire 14, thereby completing the electric circuit. The arm 13 may be formed of resilient material so that the spring action thereof normally holds the metal contact point 12 in engagement with the metallic contact point 11 of the bar 10. These metal contact points 11 and 12 may be formed of any suitable metal, although it may be mentioned that silver and platinum have been found to give excellent results.

A vertically disposed plunger 15 is slidable through a guide and packing sleeve 16 in the top 1, the upper end of the plunger engaging the spring contact arm 13, while the lower end thereof is secured to an ether thermostat 17 carried by one end of an adjusting lever 18. This lever is pivotally mounted at an intermediate point in its length, as indicated at 19, between a pair of bracket arms 20 which project downwardly from the top 1, the opposite end of the adjusting lever being provided with a screw 21. The upper end of this screw 21 may engage a bearing plate 22 applied to the lower surface of the top 1, while the lower end of the adjusting screw is provided with a handle 23. With this construction it will be obvious that by grasping the handle 23 and rotating the screw 21 the ad-

justing lever 18 can be swung about its pivotal connection with the brackets 20 for the purpose of raising and lowering the end thereof upon which the thermostat 17 is mounted. In this manner, proper adjustment can be accurately made for maintaining either a higher or a lower temperature within the incubator box.

When the electric current is turned on, the resistance wire 5 acts in the usual manner to heat the interior of the incubator, the metallic contact members 11 and 12 being normally in engagement with each other. As soon as the temperature within the incubator rises above the predetermined point, the ether thermostat 17 expands and forces the plunger 15 upwardly, said plunger engaging the spring arm 13 and springing the movable contact point 12 out of engagement with the fixed contact point 11, thereby interrupting the circuit and preventing further heating of the incubator. As soon as the temperature within the incubator drops the contraction of the ether thermostat 17 will permit the plunger 15 to drop, with the result that the contact point 12 will again be sprung into engagement with the contact point 11 by the resiliency of the spring arm 13. The circuit being then closed the resistance wires 5 will again become heated, and in this manner a perfect control of the heat is possible, the heat controlling means being sensitive to very slight changes. The resistance wire 5 is stretched horizontally above the eggs, so that the heat is applied in the natural manner to the top of the eggs, and the bottom of the incubator is covered with a reticulated sheet so that the carbonic acid gas escapes as soon as released, instead of accumulating within the incubator box. A high degree of efficiency is thus obtained, and large hatches can be depended upon.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:—

1. An electrically heated incubator, including a box, a resistance wire extending horizontally across the box above the eggs, feed wires connected to the resistance wire to complete the circuit and supply current thereto, a fixed metallic contact member and a swinging metallic contact member interposed in the circuit, said contact members being normally in engagement with each other, an adjusting lever mounted within the box, a thermostat carried by the adjusting lever, means for locking the adjusting lever in different positions with the thermostat at different elevations, and a plunger carried by the thermostat and engaging the swinging contact member to move the same and interrupt the circuit when the temperature within the incubator reaches a predetermined point.

2. An electrically heated incubator, including a box, a resistance wire extending horizontally across the box above the eggs, feed wires connected to the resistance wire to complete the circuit and supply current thereto, a fixed metallic contact member and a swinging metallic contact member mounted upon the top of the box and interposed in the circuit, the said contact members being normally in engagement with each other, a bracket pendent from the top of the box, an adjusting lever pivotally mounted upon the bracket, a thermostat carried by the adjusting lever, means for locking the adjusting lever in different positions with the thermostat at different elevations, and a plunger carried by the thermostat and passing loosely through the top of the box, said plunger engaging the swinging metallic contact member to move the same and interrupt the circuit when the temperature within the box reaches a predetermined point.

3. An electrically heated incubator, including a box, a resistance wire extending horizontally across the box above the same, feed wires connected to the resistance wire to complete the circuit and supply current thereto, a fixed metallic contact member and a swinging metallic contact member interposed in the circuit and mounted upon the top of the box, said contact members being normally in engagement with each other, a bracket pendent from the top of the box, an adjusting lever pivotally mounted upon the bracket at an intermediate point in its length, a thermostat carried by one end of the adjusting lever, an adjusting screw acting upon the opposite end of the adjusting lever to set the lever in different positions with the thermostat at different elevations, and a vertically disposed plunger carried by the thermostat and passing slidably through the top of the box, said plunger engaging the swinging contact member to move the same and interrupt the circuit when the temperature within the box reaches a predetermined point.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN DAVID GRAVES.

Witnesses:
H. L. WATT,
S. ONO.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."