

(No Model.)

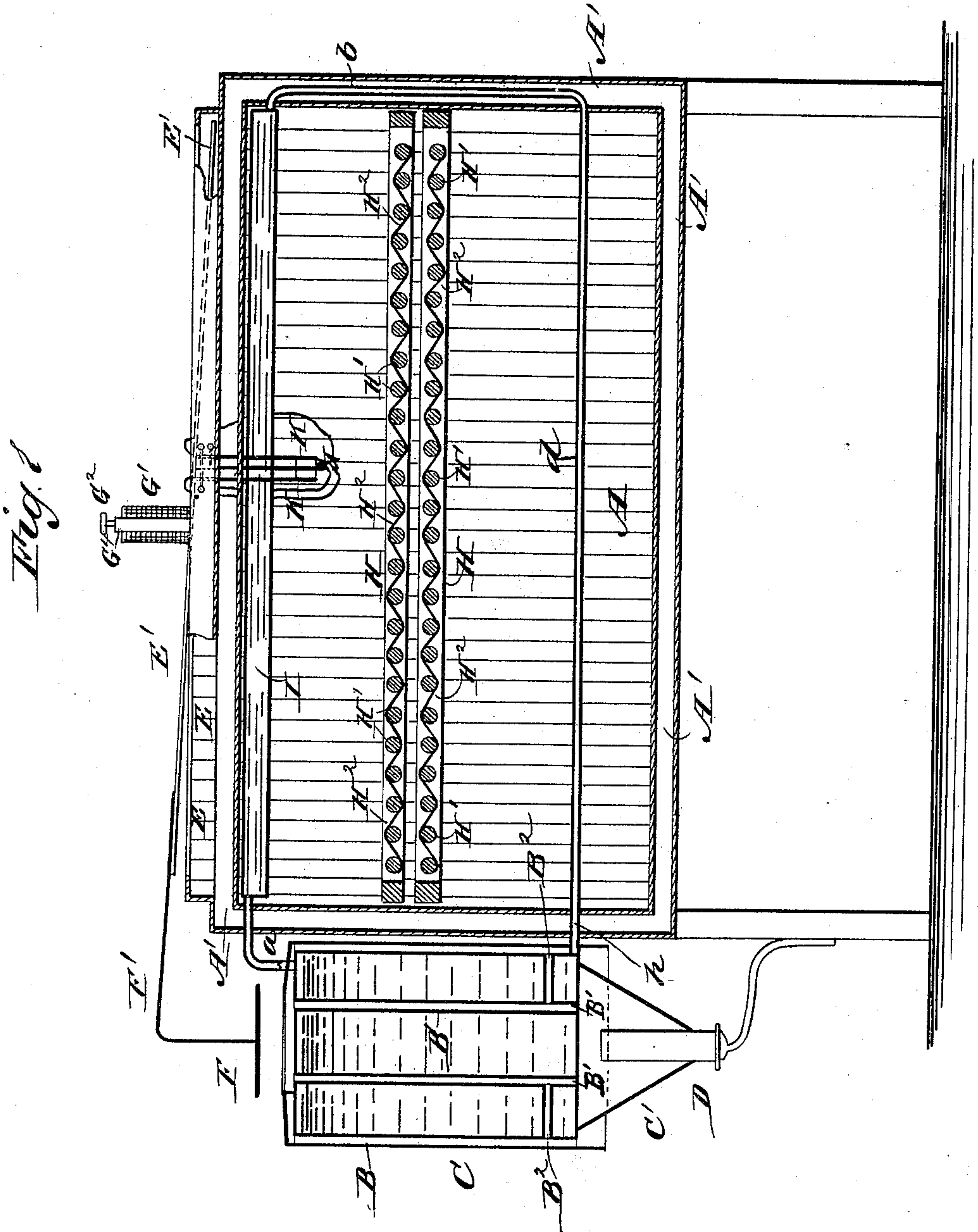
2 Sheets—Sheet 1.

J. L. COUSINS.

HEAT REGULATING MECHANISM FOR INCUBATORS.

No. 330,379.

Patented Nov. 17, 1885.



WITNESSES:

H. Mc Ardle
C. Sedgwick

INVENTOR:

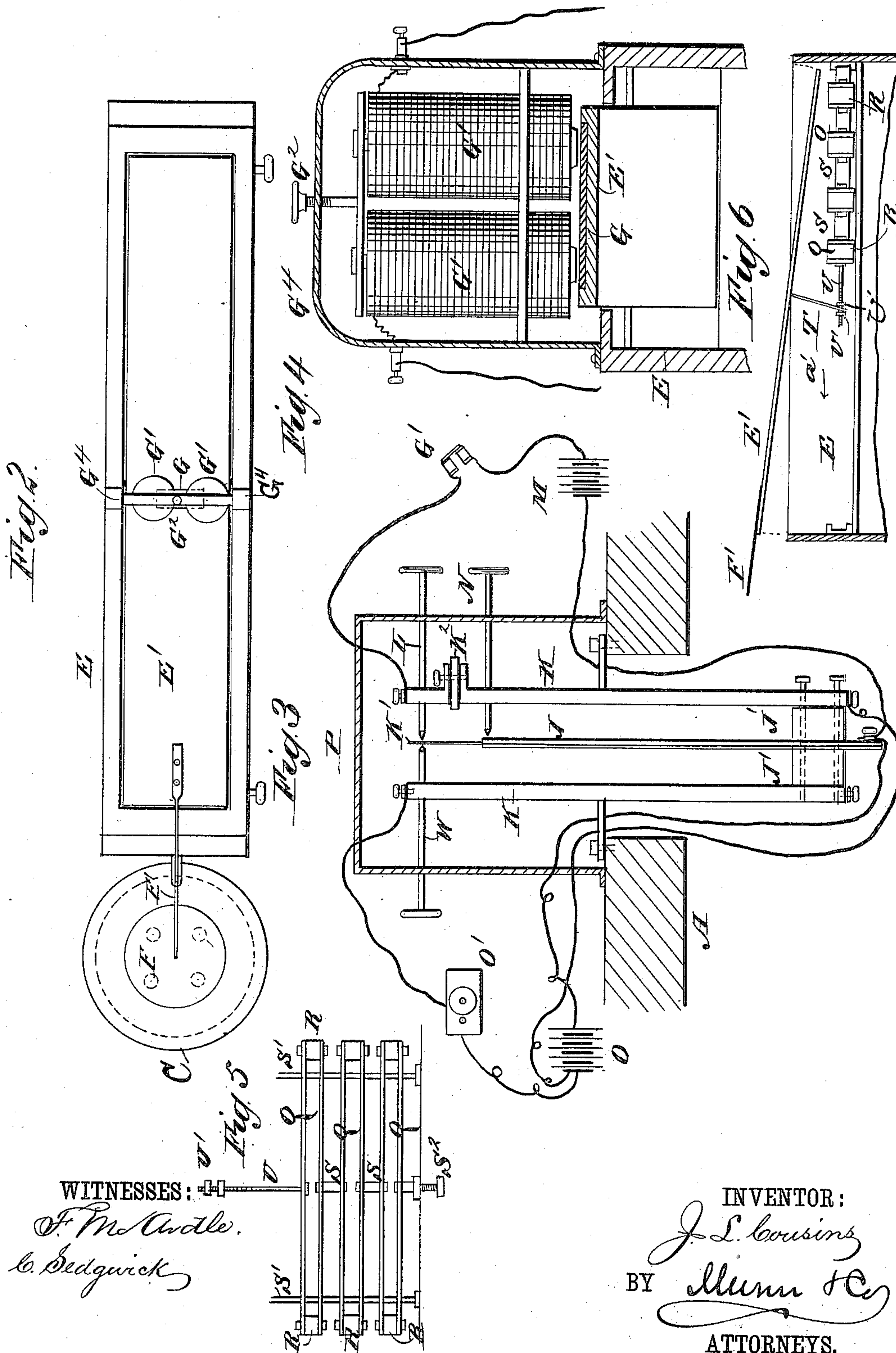
J. L. Cousins
BY *Munn & Co*
ATTORNEYS.

J. L. COUSINS.

HEAT REGULATING MECHANISM FOR INCUBATORS.

No. 330,379.

Patented Nov. 17, 1885.



WITNESSES:

F. McCordle.
C. Sedgwick

INVENTOR:

J. L. Cousins
BY *Miller & Co*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JASON L. COUSINS, OF KANE, PENNSYLVANIA.

HEAT-REGULATING MECHANISM FOR INCUBATORS.

SPECIFICATION forming part of Letters Patent No. 330,379, dated November 17, 1885.

Application filed April 29, 1884. Serial No. 129,718. (No model.)

To all whom it may concern:

Be it known that I, JASON L. COUSINS, of Kane, in the county of McKean and State of Pennsylvania, have invented a new and Improved Heat-Regulating Mechanism for Incubators, of which the following is a full, clear, and exact description.

The invention consists in the construction and arrangement of parts, as will be herein-
after fully described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of an incubator provided with my invention. Fig. 2 is a plan view of the valve. Fig. 3 is a sectional view of the heat-regulating device. Fig. 4 is a cross-sectional view of the valve and a face view of the magnet for operating it. Fig. 5 is a plan view of a modified construction of the thermostat. Fig. 6 is a side view of the same, showing its connection with the valve.

The box A for receiving the egg-trays is surrounded on all sides by an air-space, A', or by a suitable non-conductor of heat, and on the side of the box a boiler, B, is held, which is provided with two upright hot-air flues, B', and at the bottom with two or more horizontal air-flues, B². A jacket, C, surrounds the entire boiler. The gas or oil burner D is held in a funnel, C', on the bottom of the boiler, which funnel surrounds the burner. The top of the boiler is connected by a pipe, a, with a horizontal water-tank directly below the top of the box, and the said tank is connected by a pipe, b, with a series of pipes, d, or a serpentine pipe a short distance above the bottom of the box, which pipes are connected with the bottom of the boiler by a pipe, h. In the top of the box a longitudinal ventilating-flue, E, is arranged, in which a longitudinal valve, E', is pivoted at or near its middle and in such a manner that it will be about balanced, the said valve being adapted to swing in a vertical plane and being adapted to close the opening in the flue E. A damper, F, adapted to close the opening in the top of the jacket C, is held on the end of an arm, F', projecting from the end of

the valve. A metal plate, G, is embedded in or held on the top of the valve E' a short distance from the pivot and below an electromagnet, G', surrounded by a frame, G⁴. A set-screw, G², is provided in the said frame for raising or lowering the magnet.

H H' H² represent the egg-tray and egg-rolling mechanism.

A bar, j, formed of two different metals, is held between two upright bars, K, insulating-blocks J' being interposed between the lower ends of the bar J and the bars K. A steel spring, K', projects from the upper end of the bar J. The bar J bends to the right when expanding and to the left when cooling. This bar is formed of two strips of metal of unequal expansive properties secured together, the left-hand strip being of greater expansibility than the right-hand strip, so that under heat the left-hand strip will expand more than the right-hand strip, and thus cause the bar J, formed by them, to bend to the right, and when cooling to assume a natural position.

K² is an insulating piece between two parts of one bar K.

A set-screw, L, having a platinum-tipped end, is connected with a battery, M, which battery is connected with the lower end of the bar J and with the magnet G'.

The lower part of one bar K, in which a screw, N, is held, is connected with a battery, O, connected with an electric bell, O', and with the upper end of the other bar K. The battery O is also connected with the lower end of the bar J.

The thermostat is held in a box, P, at the top of the box A, and projects down into the space below the tank I.

If desired, the electric thermostat just described can be dispensed with, and the thermostat shown in Figs. 5 and 6 may be used. This is formed of a series of bars, Q, each formed of two layers of metal having different expanding qualities, which bars are united at the ends by blocks R, and at their centers by rods S, in the manner shown. The bars rest on guide-rods S'.

The valve E' is provided with a downwardly-projecting rod or arm, T, through a slot of which a rod, U, passes, which rod projects

from one of the end bars, Q, and which rod U is provided with nuts U' for adjusting the arm or rod T in place. An adjusting-screw, S², is provided for adjusting the thermostat when the box is closed.

The metal having the greatest expansive power is placed on the outside, so that when the heat rises too much the thermostat swings the arm T in the direction of the arrow a' and raises the valve E', as shown in Fig. 6.

The operation is as follows: If the valve closes the ventilating-flue, the temperature in the box A rises, and when it arrives at a certain degree the bar J is moved to the right, the spring K' comes in contact with the platinum-tipped end of the screw L, the electric circuit is closed, and the magnet G' is excited and raises the valve E', thus permitting the hot air to escape, cold air passing in through a suitable opening in the bottom of the box. At the same time the damper F is raised the hot air is not confined in the boiler and does not heat the water, and cold air enters through the flues E² and cools the boiler to a certain extent. If the temperature in the box drops one-tenth of a degree, the thermostat-bar J swings to the left, the circuit is broken, and the valve E' released. The valve swings down and closes the opening in the flue. The damper F closes the opening in the top of the jacket C. The hot air is confined in the boiler and heats the water. If the magnet fails to open the valve, the heat rises still higher until the strip J is brought in contact with the screw N, thereby closing the circuit of the battery O and sounding the alarm O'. If the light is extinguished from any cause whatever, the thermostat-bar J swings to the left and comes in contact with the screw W, held in the other bar K, closes the circuit of the battery O, and sounds the alarm-bell O'.

The box A is to be made of hard compressed paper. If desired, the long wing-valve may be dispensed with and a long bar or rod pivoted in the center with a valve attached to each end, magnets acting on the said rod in the same manner as they act on the long valve.

I do not claim the thermostat *per se*, nor the particular construction of the egg-rolling mechanism and incubator-box and heater in this application, reserving the right to claim the same in a separate application.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a heat-regulator for incubators, the combination, with the box A, having a longitudinal flue, E, of the valve E', pivoted in the same and forming an armature, the electro-magnet G', held above said valve, and a thermostat connected with the magnet, and a battery for automatically operating the valve, substantially as set forth.

2. The combination, with the box A, having the longitudinal flue E, of the valve E', forming an armature, the magnet G', held above the valve, the screw G², for adjusting the magnet, and a thermostat connected to the said magnet, and a battery, substantially as set forth.

3. The combination, with a valve forming an armature, of the magnet G', held above the same, a thermostat-bar, and a battery, and the thermostat, substantially as set forth.

4. The combination, with the box A and a heating device, as B, of the longitudinal flue E, the valve E', pivoted to close the same, forming an armature, and provided with a damper, F, to simultaneously open or close an opening in the heating device, the electro-magnet G', held above the valve, and a thermostat, and a battery, substantially as set forth.

5. The combination, with the valve E, of the magnet G', the bars K K, the insulating-piece K², the insulating-pieces J', the thermostat-bar J, provided with a spring, k' held between the said pieces J', the screws L, N, and W, the batteries M O, the electric bell O', and the circuit-wires, substantially as set forth.

JASON L. COUSINS.

Witnesses:

FRANK A. VAN ORSDALL.

WILLIAM HUBBARD.