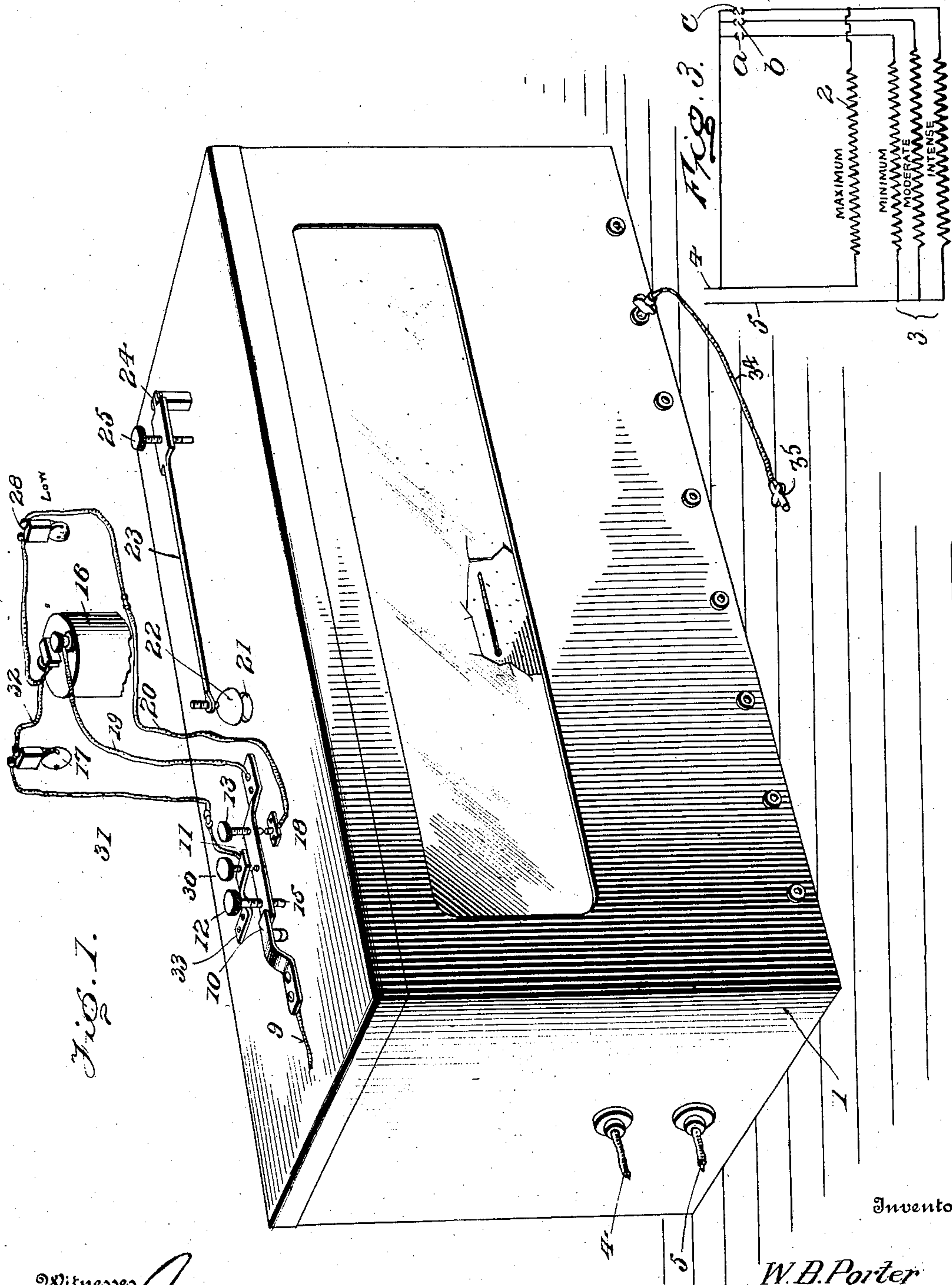


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REGULATOR FOR INCUBATORS.  
APPLICATION FILED MAR. 5, 1908.

Patented Sept. 21, 1909.  
2 SHEETS—SHEET 1.



Witnesses

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Inventor

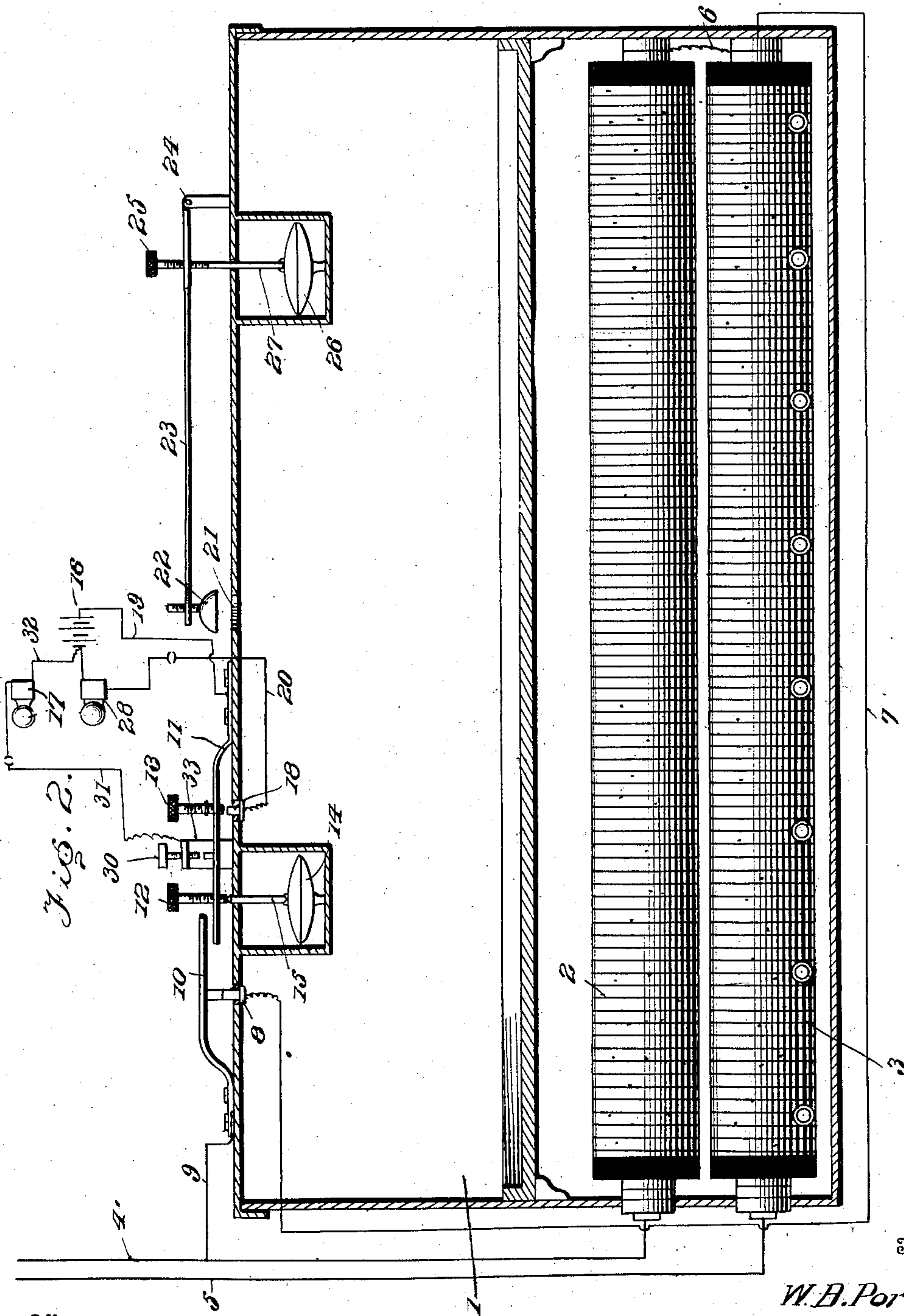
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# UNITED STATES PATENT OFFICE.

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## REGULATOR FOR INCUBATORS.

934,754.

Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed March 5, 1908. Serial No. 419,364.

*To all whom it may concern:*

Be it known that I, WILLIAM B. PORTER, citizen of the United States, residing at Aberdeen, in the county of Monroe and State of Mississippi, have invented certain new and useful Improvements in Regulators for Incubators, of which the following is a specification.

The present invention provides novel means particularly adapted for incubators and brooders, but which may be adapted for hot beds or other places where a uniform temperature is required. But inasmuch as the invention is particularly designed for incubators it is shown in this adaptation in the accompanying drawings.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which:

Figure 1 is a perspective view of an incubator embodying the invention. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a diagram showing resistance.

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.

The box, framework or casing 1 of the incubator may be of any construction and capacity and is provided in its lower portion with electric heat coils 2 and 3 and at its top with thermal regulating devices for making and breaking the various electric circuits and controlling the draft.

4 and 5 indicate leads or wires having connection with electric conductors which derive current from a suitable source of power.

The electric heat coils 2 and 3 are connected at one end at 6 and from opposite ends are electrically connected to the respective leads 4 and 5. A wire or lead 7 connects one end of the heat coil 3 with a contact point 8 and a wire 9 connects a switch arm 10 adapted to make electric connection with the contact 8 and closes the circuit through the heat coil 3 under certain

conditions. When the circuit is interrupted at 8, the current flows from lead 4 through heat coil 2, thence through heat coil 3 to lead 5, but when the circuit is closed at 8 the current flows from lead 4 through the wire 9, switch arm 10, wire 7, coil 3 to lead 5, thereby cutting the heat coil 2 out of circuit because the current finds a shorter path through the single heat coil 3.

An arm 11, secured at one end to the box or casing of the incubator has its opposite end free and extended across the path of the switch arm 10. Set screws 12 and 13 are threaded into the arm 11 and constitute adjustable members. A thermostat 14 of any construction or make is arranged in the upper portion of the incubator so as to be affected by the change of temperature. A stem 15 projected from the thermostat 14 is adapted to be engaged by the set screw 12, thereby causing the arm 11 to move with variations in the temperature of the incubator. The point at which the thermostat 14 serves to make or break the circuit through the heat coils, is regulated by adjustment of the set screw 12.

An alarm circuit cooperates with the incubator and comprises a battery 16, signals 17 and 28 included in separate circuits, and circuit closing means. The signals 17 and 28 may be conveniently located and of any construction so long as they serve to give warning of extreme conditions. One signal, as 17, is actuated when the temperature abnormally increases. The other signal, as 28, operates to give warning when the temperature within the incubator falls below a given point. An arm 11 is common to both signal circuits and is connected with one pole of the battery 16 by means of the wire 19, and is provided with a contact 13 in the form of a set screw. A contact 18 is connected by wire 20 with the signal 28, the latter in turn being connected with the opposite pole of the battery 16. When the temperature falls below a given point, the contacts 13 and 18 make electrical connection and close the low alarm circuit. A wire 32 connects the signal 17 with one pole of the battery 16 and a wire 31 connects said signal 17 with a bracket 33, which is provided with an adjustable contact 30 in the form of a set screw. When the temperature within the incubator abnormally rises, the thermostat 14 expands and moves the free end of the arm 11 upward and makes electrical con-



nection between it and the contact 30, thereby closing the high alarm circuit. A vent 21 is provided in the upper portion of the incubator and is controlled by means of a damper 22 which is carried by means of an arm 23 pivoted at 24 and provided with a set screw 25 forming a stop. A thermostat 26 arranged in the upper portion of the incubator has its stem 27 projected so as to be engaged by the set screw or stop 25. The parts are so arranged and adjusted that when the incubator is properly working, the damper 22 is slightly opened, thereby admitting of a circulation of air through the incubator, but should the temperature rise abnormally the thermostat 26 will move the damper 22 so as to uncover the vent 21 to a greater extent and thereby provide for an increased circulation or outflow of hot air from the incubator. On the other hand, should the temperature within the incubator fall below a given point, the thermostat 26 will contract and permit the damper 22 to close, and thereby shut off outflow of the warm air.

When adapting the invention to an incubator, brooder or other location, the set screws 12 and 13 are adjusted and the remaining parts arranged so that when the parts are properly working, the alarm circuit is interrupted and the secondary heat coil 2 is cut out by reason of the increased resistance to the path of the circuit. When the temperature increases, the thermostat 14 expands and breaks the direct circuit through the heat coil 3, so that the current flows through both heat coils, and this increased resistance reduces the temperature. Should the temperature from any cause fall below a given point, the thermostat 14 will contract and thereby bring the alarm circuit into play. It is to be understood that the signal 17 may be an electric bell, annunciator, or other appliance, to attract attention so that the difficulty may be promptly remedied. The heat coil 3 may be provided in sections and one or more of the sections may be cut out by means of a wire 34 and plug 35.

It is to be understood that the incubator may be located in an outhouse or at any convenient point and operate from the residence or other distant point. It is preferred to have the appliance attached directly to the incubator. In the construction shown in Fig. 3, four resistance windings are illustrated, which for convenience are designated as maximum, minimum, moderate and intense. Any resistance is adapted to be cut into or out of circuit by the attendant by means of plugs inserted at *a*, *b*, *c*. Suppose, for instance, a plug is inserted at *a*, minimum resistance, the signal 17 sounds, indicating the temperature is too high. By removing the plug from *a* and inserting the same at *b*, the current passes through mod-

erate resistance, and if the temperature is still too high, the plug is shifted from *b* to *c*. When the plug is entirely removed, the current is compelled to pass through maximum resistance. On the other hand, should the temperature be too low, the plug is moved from *c* toward *a*, as will be readily understood. After the parts have been once adjusted, the temperature will remain practically at a given degree. The normal tendency of the arm 11 is downward at its free end, thereby tending to bring the contacts 13 and 18 into engagement so as to sound the low alarm. In its specific construction, the arm 11 is a flat spring, its free end being controlled by the thermostat 14 whose stem 15 is in contact with the set screw 12. Under normal conditions the free end of the arm 11 is held in such position that the contacts 13 and 18, and 30 and 11, are separated. Should the temperature fall below a given point, the thermostat 14 contracts and admits of the free end of the arm 11 moving downward so as to bring the contacts 13 and 18 into engagement with the result that the low alarm 28 is sounded. On the other hand should the temperature rise abnormally, the thermostat 13 expands, thereby moving the free end of the arm 11 upward and bringing it into electrical contact with the part 30 with the result that the alarm 17 is sounded.

Having thus described the invention, what is claimed as new is:

1. In an electric heat controlling means, the combination of a series of heat coils included in a circuit, a second circuit for short circuiting the current through a selected coil of the series and including a circuit closer, and a thermostat for regulating said circuit closer and controlled by the change of temperature produced as a result of the action of the said heat coils.

2. In combination, two heat coils included in a main circuit, a second circuit including one of said heat coils only and provided with a circuit closer, and a thermostat for making and breaking said second circuit and controlled by the change of temperature developed by the action of said heat coils.

3. In combination, a connected series of heat coils included in a main circuit, a second circuit including one of said heat coils and including a circuit closer, an arm extended into the path of said circuit closer, a thermostat for regulating the movements of said arm, and an alarm circuit including a circuit closer controlled by the movements of the said arm.

4. In an incubator provided with a vent, a damper for controlling said vent, a thermostat actuated by the change of temperature of the incubator for regulating said damper, heat coils arranged within the incubator and included in a main circuit, a second circuit including one of said heat coils



only and including a circuit closer, an arm  
extended into the path of said circuit closer,  
a thermostat actuated by the change of tem-  
perature of the incubator for regulating the  
5 movements of said arm, and an alarm circuit  
including a circuit closer controlled by the  
movements of said arm.

In testimony whereof I affix my signature  
in presence of two witnesses.

WILLIAM B. PORTER. [L. S.]

Witnesses:

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