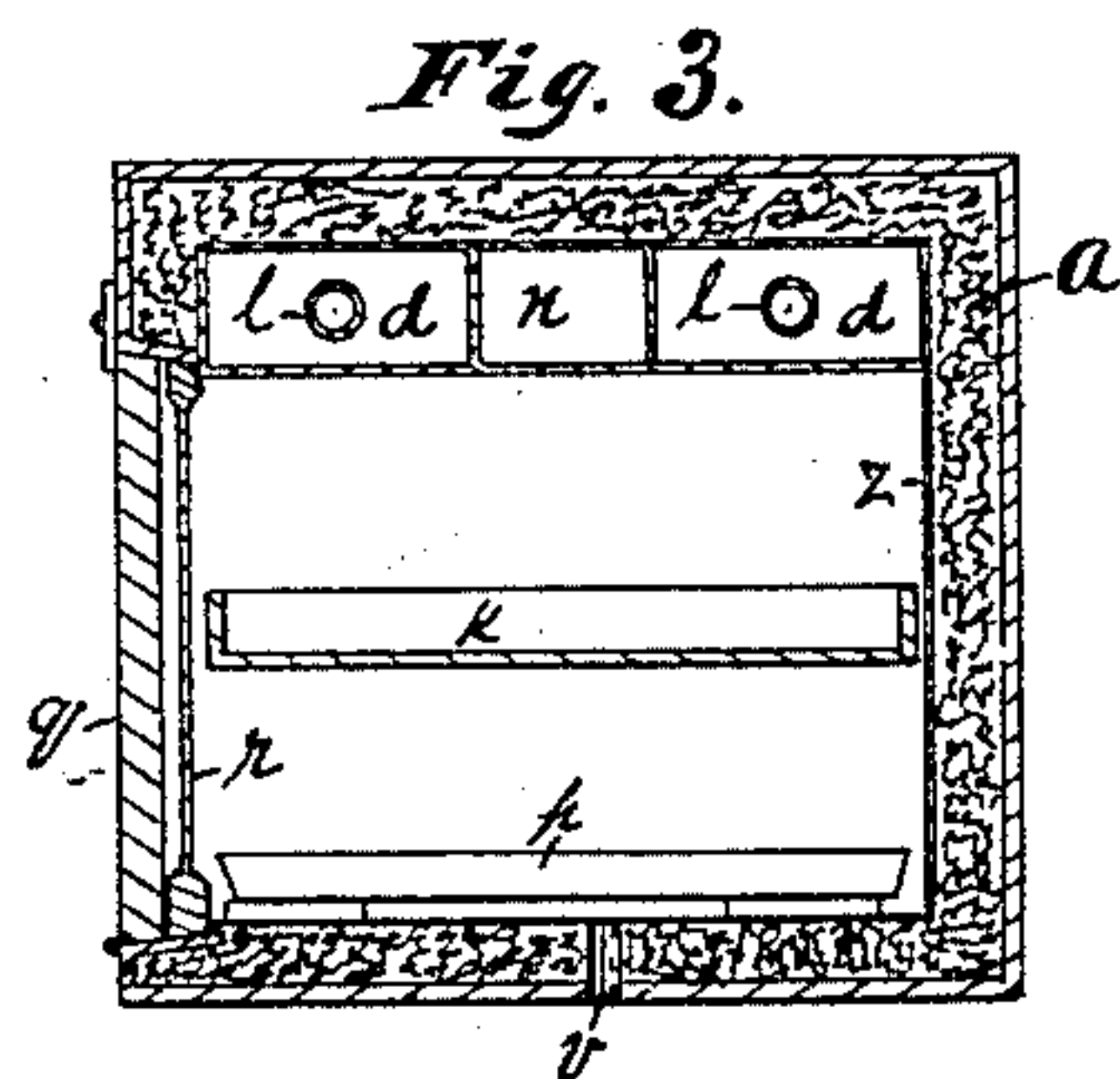
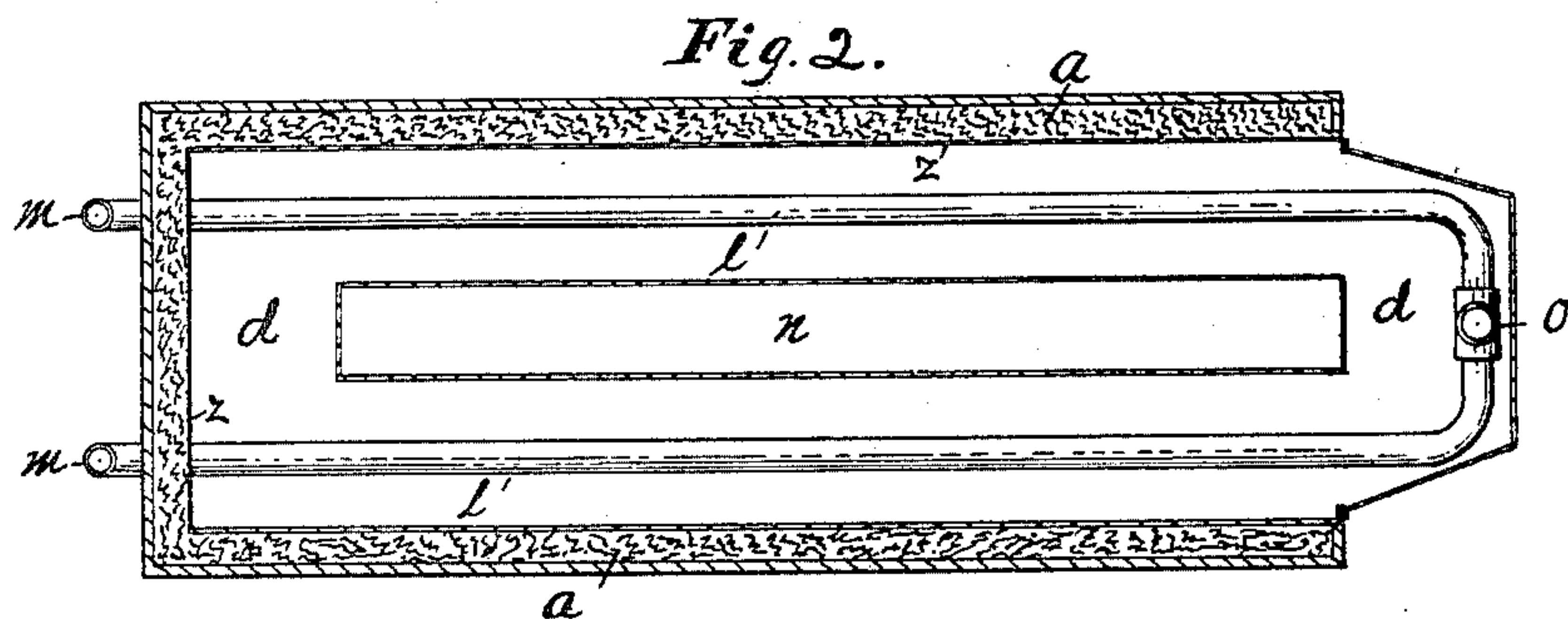
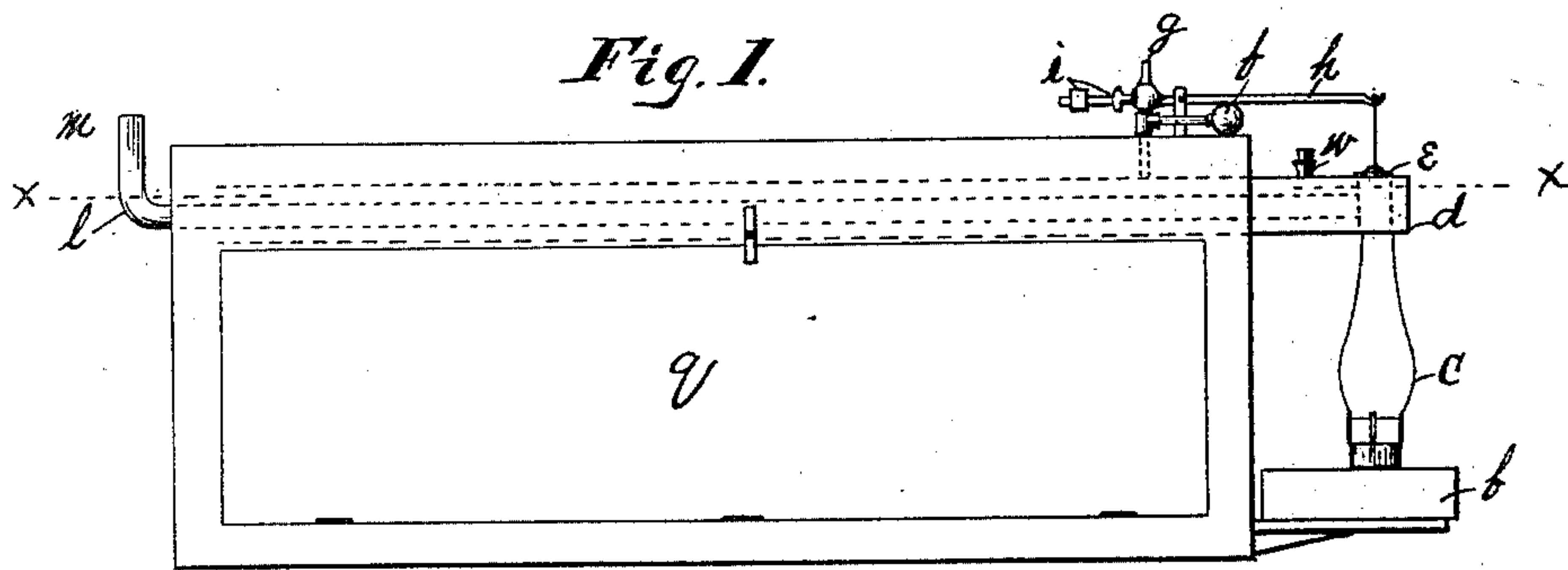


(No Model.)

F. J. PALMER.
INCUBATOR.

No. 442,294.

Patented Dec. 9, 1890.



Witnesses
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UNITED STATES PATENT OFFICE.

FRANK J. PALMER, OF CENTRAL VILLAGE, MASSACHUSETTS.

INCUBATOR.

SPECIFICATION forming part of Letters Patent No. 442,294, dated December 9, 1890.

Application filed August 4, 1890. Serial No. 360,931. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. PALMER, a citizen of the United States, residing at Central Village, in the county of Bristol and State of Massachusetts, have invented a new and useful Improvement in Incubators, of which the following is a specification.

The accompanying drawings illustrate my invention, in which—

10 Figure 1 is a side elevation of my improved incubator. Fig. 2 is a plan view of the same in section through line *x x*. Fig. 3 is an end view in vertical section of Fig. 1.

Similar letters refer to similar parts throughout the several views.

20 The incubator consists of a rectangular box having its top, bottom, ends, and one side composed of a zinc lining *z*, a thickness of wool *a*, and an outer thickness of wood. The remaining side of the box is made to open like a door, and consists of the outer door *q* and an inner glass door *r*. The upper part of the inside of the box is supplied with the water-tank *d*, surrounding the air-chamber *n*, as fully shown in Fig. 2. This water-tank projects through one end of the box, and is supplied with pipes *l*, running from the cross-connection *o* through the length of said tank and through the opposite end of the box, 30 where they are turned upward, as at *m*.

b is a lamp conveniently secured to the end of the box, having the top of its chimney *c* entered in the lower opening of the cross-connection *o*.

35 *g* is a pipe connecting with the interior of the air-chamber *n*, having stop-cock *i*. Just below the cock *i* the pipe *g* is supplied with a branch pipe, to the end of which is secured the hollow rubber ball *f*.

40 *h* is a lever pivoted to a standard, to one end of which is suspended the cover *e*, adapted to rest on and close the upper opening in the cross-connection *o*. The opposite end of said lever *h* is provided with a sliding weight to nearly or quite balance the cover *e*. The rubber ball *f* on the end of the branch pipe is interposed between the top of the box and the under side of the lever *h* and between where the lever is pivoted and the end which 50 carries the cover *e*.

k is a drawer in which the eggs are placed to be hatched.

p is a pan resting on supports, which raise it a slight distance from the bottom of the box, and designed to hold water when it is 55 desired to increase the moisture of the air in the interior of the incubator.

v is an opening in the bottom of the box, connecting its interior with the outside air, in order that any foul odors or gases which 60 may be generated in hatching the eggs may escape.

w represents a nozzle through which water is introduced into the water-tank *d*, and which may be closed by a cork or other suitable 65 means.

The operation of my device is as follows: The eggs are placed in the drawer *k* and the doors *r* and *q* closed. The tank *d* is then filled with water and the lamp *b* lighted. 70 The weight on the lever *h* is adjusted so that the cover *e* shall close the upper opening in the cross-connection *o*. The heat of the lamp ascends into the cross-connection *o* and passes into and through the pipes *l* and escapes into 75 the open air at *m*. The heat of the lamp in passing through the pipes *l* warms the water in the tank *d*, and consequently the air in the space under the tank, and also the air in the air-chamber *n*. As the temperature increases, 80 the air in the chamber *n* expands sufficiently to expand the rubber ball *f*, thus raising the lever *h*, and consequently the cover *e*, which allows the heat of the lamp to pass upward into the open air instead of through the pipes 85 *l*. When the temperature has decreased sufficiently to allow the rubber ball *f* to contract, the cover *e* falls to its place, and the heat of the lamp is again caused to pass through the pipes *l* and increase the temper- 90 ature of the water in the tank *d*. By means of the cock *i* in the pipe *g* some of the air in the air-chamber *n* may be allowed to escape, in order that a higher temperature may be required to expand the ball *f* and raise the 95 cover *e*; or a greater quantity of air may be introduced into the air-chamber, in order that a lower temperature may be required to cause the cover *e* to rise. Thus it will be seen that a perfect and automatic regulation of the 100 temperature of the interior of the incubator to any desired degree of heat may be obtained by means of the sliding weight on the lever *h* and the quantity of air in the chamber *n*.

This feature of nicety of automatic regulation to a certain degree of temperature is of great importance, as on it depends in a great measure the success or failure of hatching eggs artificially.

What I claim, and desire to secure by Letters Patent, is—

1. In an incubator, the combination of a chamber adapted to contain the eggs to be hatched, an inclosed water-tank in the upper part of and projecting through one end of said chamber, where it is provided with a vertical opening adapted to receive the heat of a lamp, heat-pipes connected with said vertical opening and extending through the interior of said tank to the outside of said chamber, adapted to convey heat from said lamp, whereby the water in said tank is heated, an inclosed air-chamber contiguous to said tank and provided with a pipe having a branch pipe and stop-cock leading to the outside of the incubator, a hollow rubber ball secured to the end of the branch pipe, and a lever provided with a sliding weight and having suspended from it a cover adapted to close the vertical opening in said water-tank, pivoted to the incubator and resting on said hollow rubber ball, whereby the expansion of the air in said air-chamber causes the rubber ball to expand and

through said lever and cover allow the heat of the lamp to escape upward, instead of being conducted through the pipes, when the temperature of the water has reached a certain desired degree, as set forth.

2. An incubator consisting of a chamber having a door in one of its sides and provided with a receptacle for eggs, a water-tank in the top of said chamber and projecting through one end of the same and provided with a vertical opening adapted to receive the heat of a lamp, pipes leading from said vertical opening through the interior of said water-tank, an air-chamber immediately contiguous to said water-tank and provided with a pipe leading to the outside of the incubator, having a stop-cock and a branch pipe whereon is secured a hollow rubber ball, a lever resting on said ball and pivoted to the incubator, having one end provided with a sliding weight, and a cover adapted to rest on and close the vertical opening in the water-tank, suspended to the other, and a lamp adapted to produce and convey heat into the vertical opening in the water-tank, as set forth.

FRANK J. PALMER.

Witnesses:

THOS. M. JAMES,

HENRY W. MASON.