2 Sheets—Sheet 1.

H. W. AXFORD.

INCUBATOR.

No. 183,526. Patented Oct. 24, 1876.

Fig. 1

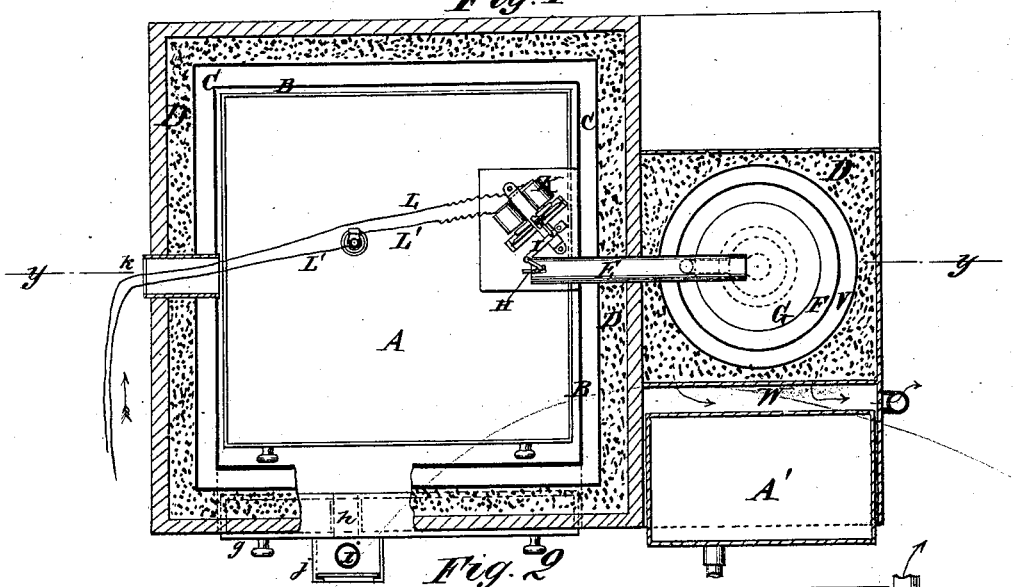
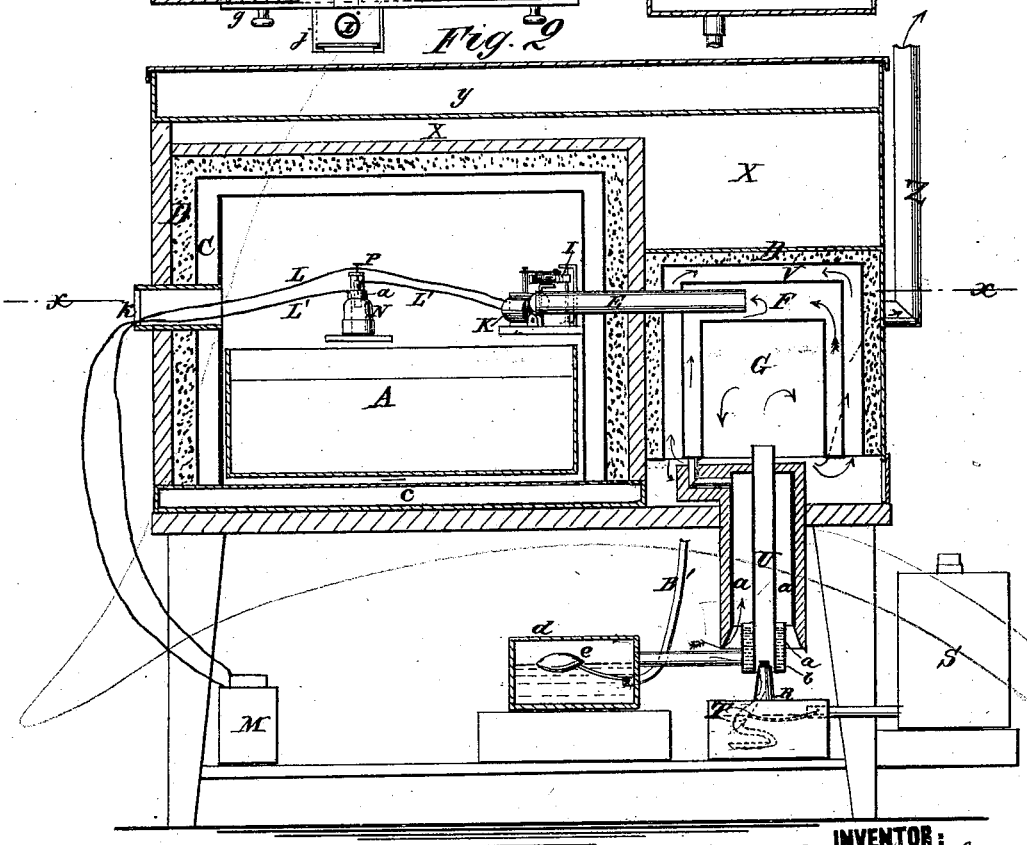


Fig. 2



WITNESSES:

A. W. Almquist

John Goethals

INVENTOR:

H. W. Axford

BY Munn & Co

ATTORNEYS.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

2 Sheets—Sheet 2

H. W. AXFORD

INCUBATOR.

No. 183,526. Patented Oct. 24, 1876.

Fig. 3

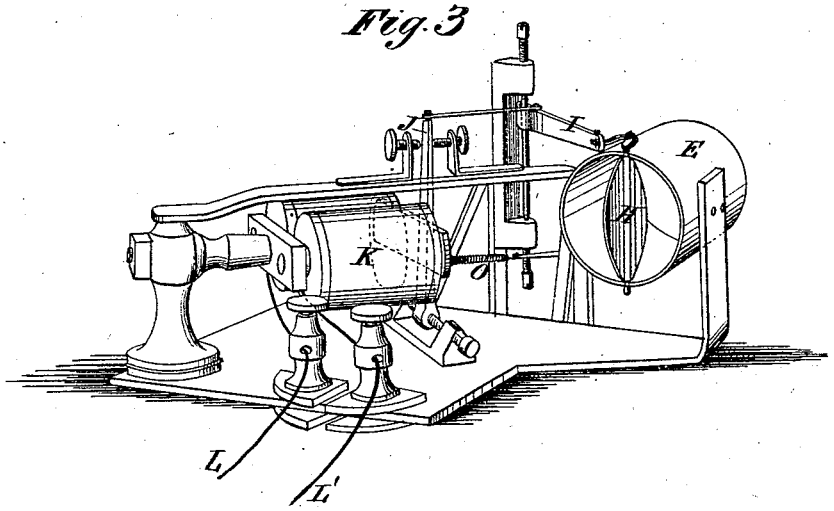
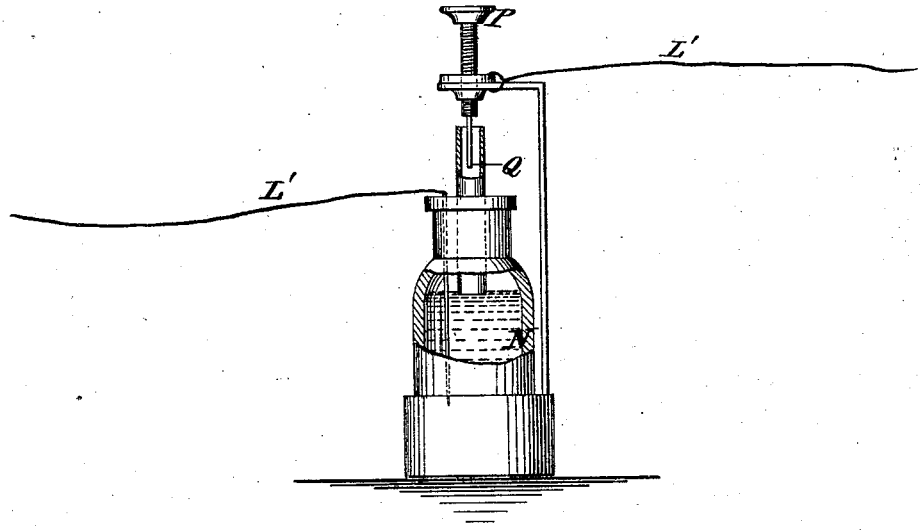


Fig. 4



WITNESSES:

A. W. Almqvist

John Goethals

INVENTOR:

H. W. Axford

BY Munn & Co

ATTORNEYS.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HARRIS W. AXFORD, OF OMAHA, NEBRASKA.

IMPROVEMENT IN INCUBATORS.

Specification forming part of Letters Patent No. **183,526**, dated October 24, 1876; application filed March 6, 1876.

To all whom it may concern:

Be it known that I, HARRIS W. AXFORD, of Omaha, in the county of Douglas and State of Nebraska, have invented a new and Improved Incubator, of which the following is a specification:

The invention relates to heating, ventilating, air-moistening, and electric heat-regulating apparatus for an incubator, the construction and arrangement of parts being as hereinafter described.

Figure 1 is a horizontal section of my improved incubator, taken in line *x x* of Fig. 2. Fig. 2 is a sectional elevation taken on the line *y y* of Fig. 1. Fig. 3 is a perspective view of the electric machine for working the valves to regulate the heat and ventilation; and Fig. 4 is partly a side elevation and partly a section of a mercury-gage for making and breaking the circuit of the electrical apparatus.

A is the pan for containing the eggs to be hatched, said pan being in an oven, B, surrounded by a dead-air space, C, and an insulating box or case, filled with powdered charcoal, D, or other non-conducting material. E is the pipe for admitting the heated and moistened air from the chamber F surrounding the heater G. This pipe contains a valve or damper, H, to be opened and closed by the lever I, which is worked by the armature-lever J of a magnet, K, to be worked by the circuit L L′ of a battery, M, the circuit to be closed by a mercury-gage, N, for closing the valve to shut off the heat when too high, and broken by said gage for allowing the valve to be opened by the spring O of the armature-lever. The mercury-gage is to enter in the center of the incubating-oven, where it is subject to the heat, and one part of the wire L′ is kept in the mercury, while the other part connects with the adjusting-screw P, which is made to dip into the gage, more or less, according to the degree of heat wanted, so that when the mercury rises to the point Q of the screw, and makes connection, the armature-lever will be attracted, and thus the valve will be closed until, by the cooling of the oven, the mercury falls away from the point where the circuit will be broken, and the valve will be opened by the spring.

The heat is furnished by a lamp, R, supplied from a tank, S, and having a float, T, and a suitable valve for automatically regulating the supply of oil, and thus maintaining regular heat. The heat passes up the chimney U into the heater G, and from heater G it passes into a chamber, V, outside of the air-heating chamber F, to heat said chamber alike on both sides, and from said chamber it passes through space W into the chamber X, for warming the floor of a cage, *y*, on the top of the incubators, for keeping the young chickens warm, and from this chamber it passes off through the smoke-pipe Z. The fresh air for heating the oven passes up around the chimney U in the passage *a*, and also around the water-heater *b*, in which steam is to be made for moistening the air, to give it about the natural moisture of the external atmosphere heated by the mother hen in the natural way. The boiler *b* is supplied from a tank, *d*, in which there is a float, *e*, and a regulating-valve to regulate the supply.

The heater and the air-heating chamber are surrounded by a jacket of non-conducting material to economize the heat and to heat the air uniformly.

A door, *g*, opens through one side of the oven to admit the pan A, and then there is an escape-passage, *h*, to a flue, *i*, in the lower part of which is a lamp, *j*, to accelerate the escape of the air after doing its work, the lamp being to create a draft in the flue. The wires L L′ pass out through a window, *k*, to the battery. A′ is a reservoir by the side of the heater, to be warmed before flowing into the regulator-tank *d* through a pipe, B.

I do not claim, broadly, a thermo-electric apparatus for regulating the admission of hot air to an apartment, being well aware such has been previously invented; nor do I claim anything shown or described in the patent of W. C. Baker, No. 152,031.

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

1. In an incubator the cage or chamber *y*, the hot-air chamber *x*, and the passage W, and the heating-chamber with which the same communicates, all combined and arranged as shown and described, for the purpose specified.

2. The mercury-gage, provided with an ad-

justable connecting-point, in combination with the electric magnet K, armature J, and the damper H, arranged in the mouth of the tube E, which projects into the oven A, as shown and described, whereby the temperature of the oven may be regulated and maintained at a higher or lower degree, as shown and described.

3. In an incubator, the mercury-gage, the magnet, and regulating-damper H, located within the oven A, in combination with the air-inlet tube E, the chambers F and G, and the heating apparatus connected therewith, all arranged as shown and described, for the purpose specified.

4. The lamp K, chimney U, air-passage *a*, water-boiler *b*, heater G V, and an insulated air-chamber F, combined substantially as shown and described.

HARRIS W. AXFORD.

Witnesses:
LUCIEN F. HALE,
J. J. POINTS.