

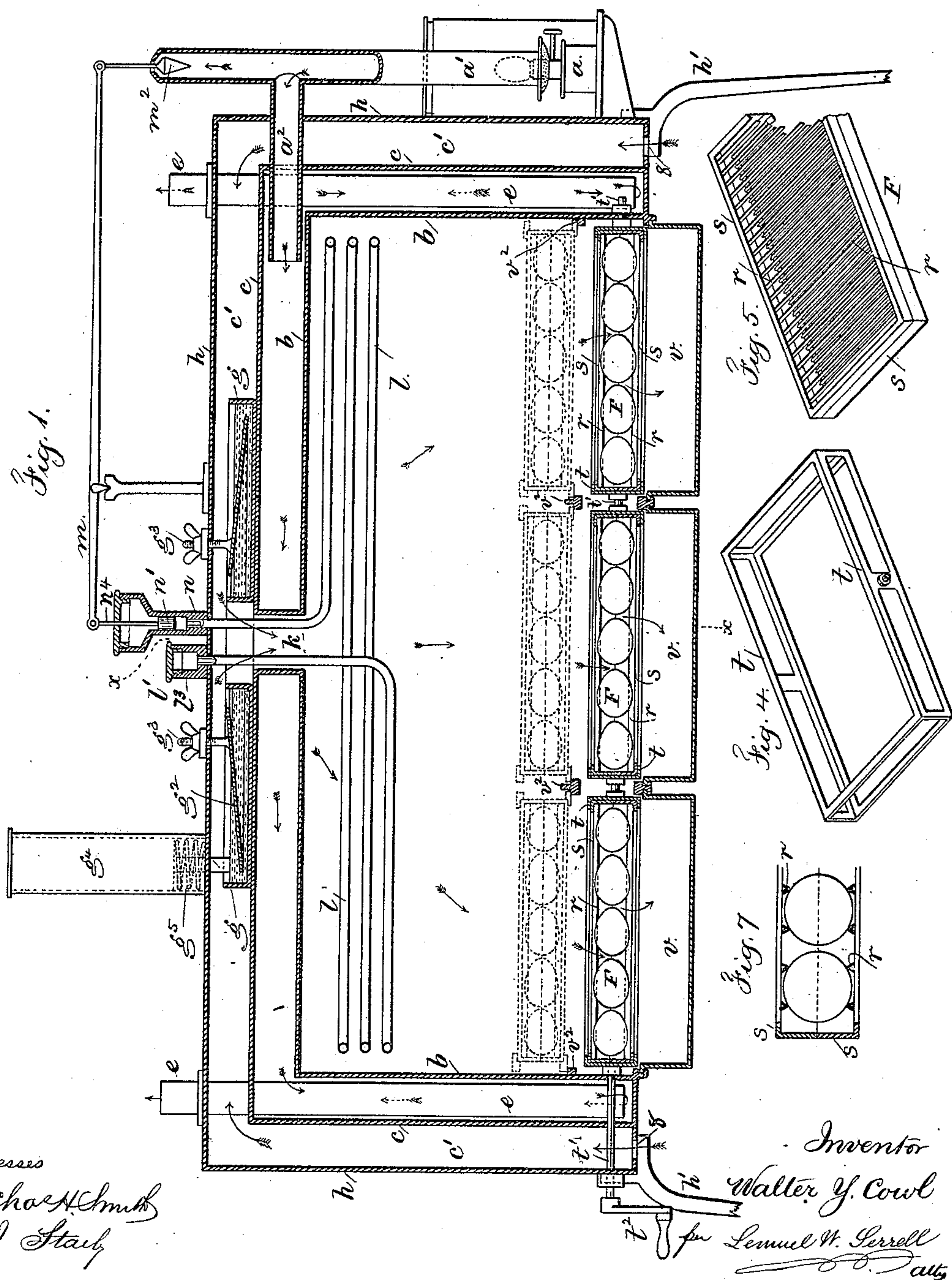
(No Model.)

3 Sheets—Sheet 1.

W. Y. COWL.
INCUBATOR.

No. 337,308.

Patented Mar. 2, 1886.



Witnesses

Chas. H. Smith
J. Stark

Inventor

Walter Y. Cowl

for Lemuel W. Gerrell
att'y

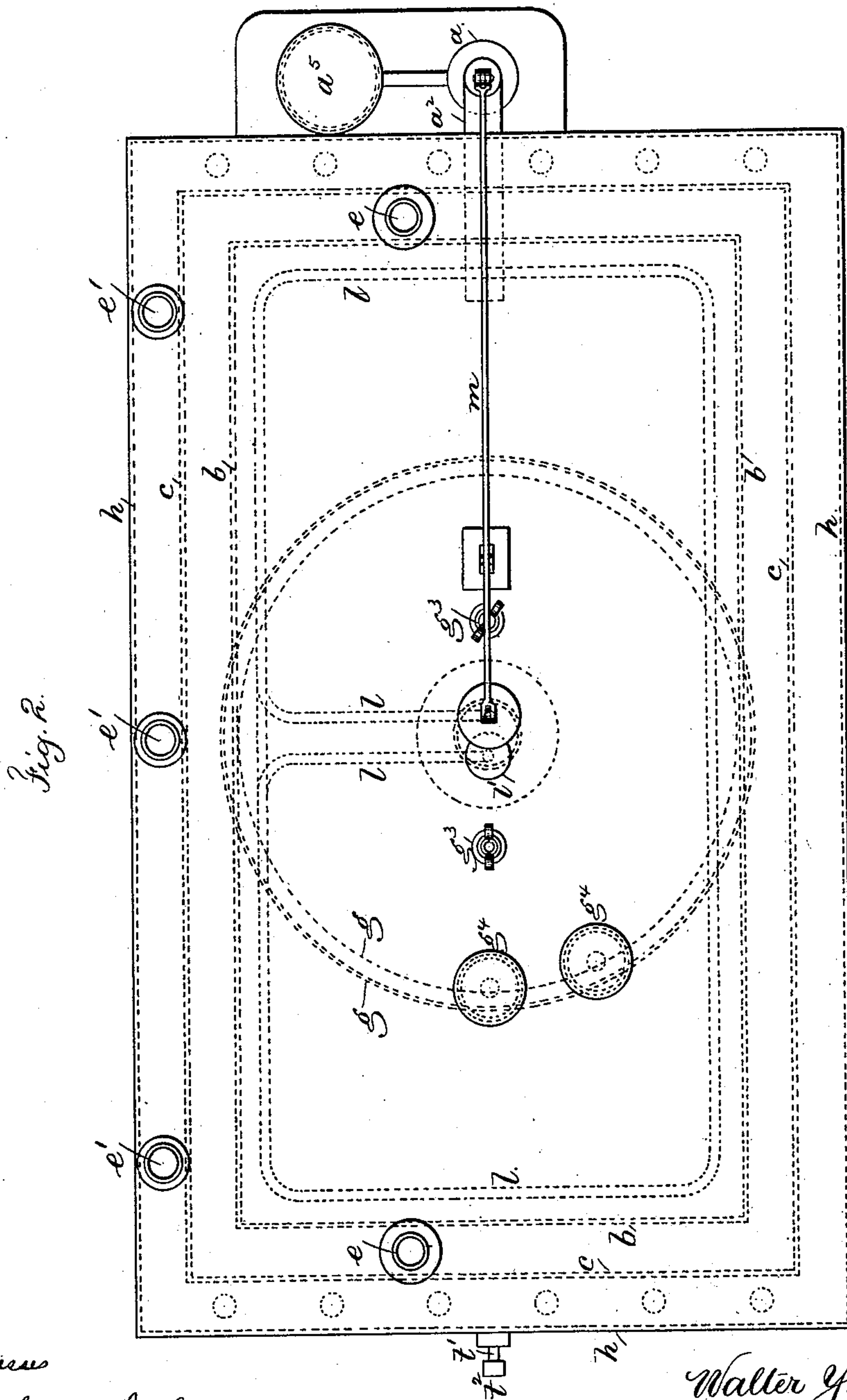
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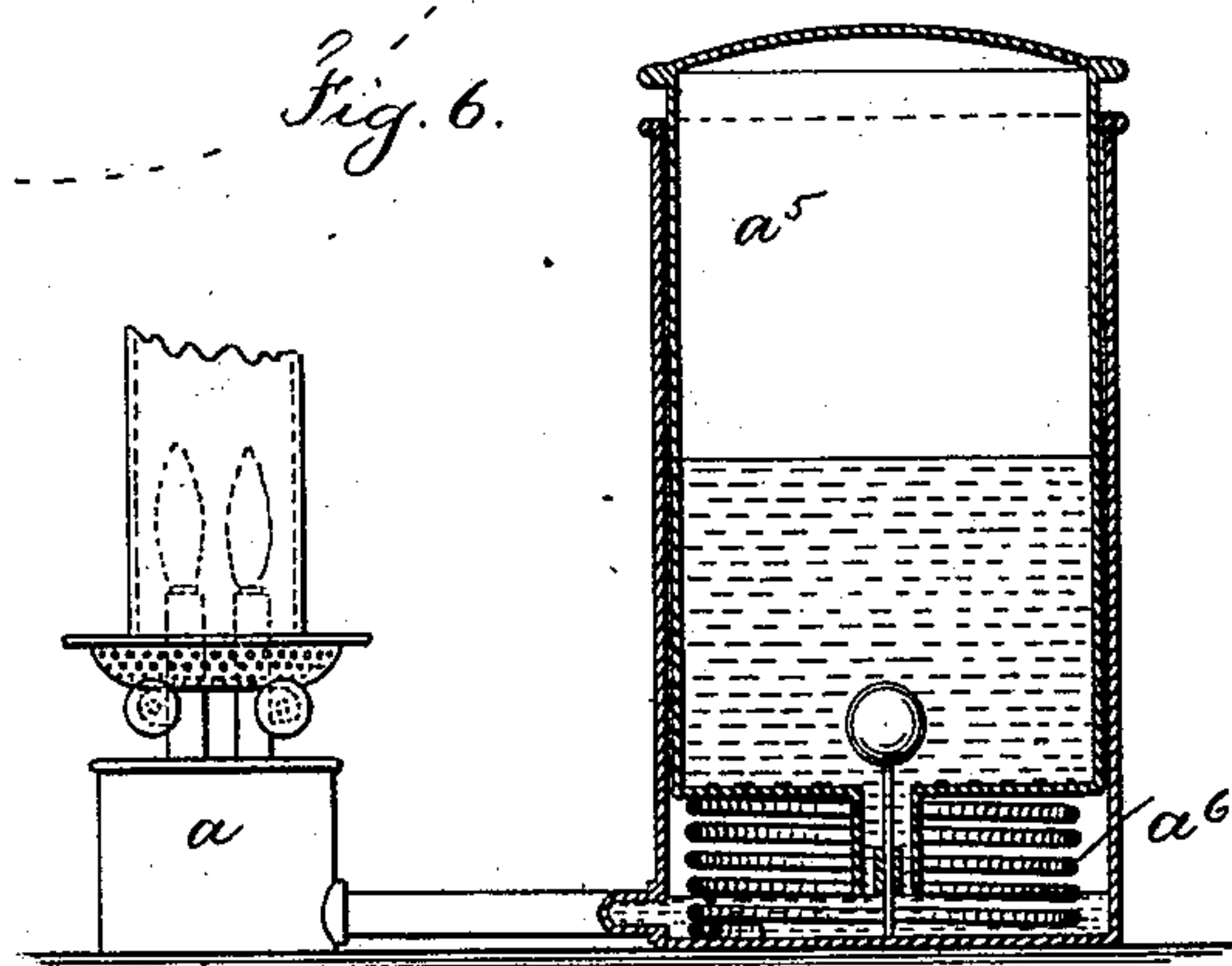
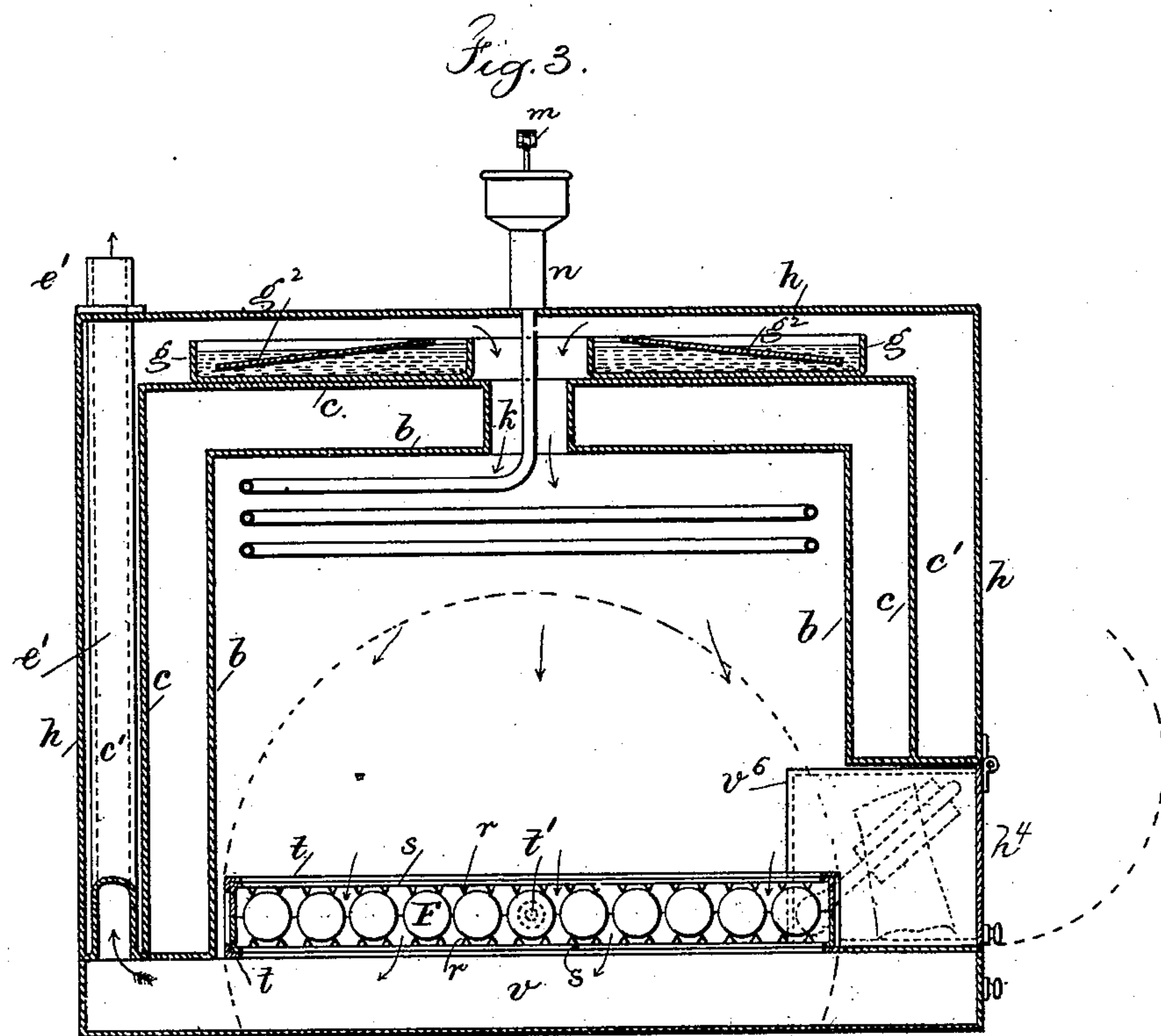
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UNITED STATES PATENT OFFICE.

WALTER Y. COWL, OF NEW YORK, N. Y.

INCUBATOR.

SPECIFICATION forming part of Letters Patent No. 337,308, dated March 2, 1886.

Application filed June 1, 1885. Serial No. 167,186. (No model.)

To all whom it may concern:

Be it known that I, WALTER Y. COWL, of the city and State of New York, have invented an Improvement in Incubators, of which the following is a specification.

The objects of the present invention are to regulate the amount of water evaporated and passed into the incubator, to thoroughly ventilate the incubator, to preserve the same from the cooling effects of air, and to facilitate the insertion of the eggs, the turning of the same from time to time, and the removal of the chickens after they have hatched out.

In the drawings, Figure 1 is a vertical section of the incubator. Fig. 2 is a plan view of the same. Fig. 3 is a cross-section at the line $x x$, Fig. 1. Fig. 4 is a perspective view of the box for holding the egg-trays. Fig. 5 is a similar view of the egg-trays. Fig. 6 is an elevation of the lamp and section of the reservoir, and Fig. 7 is a section in larger size of a portion of the egg-trays.

The exterior case, h , is by preference quadrangular and supported by legs h' of any desired character. Within the case h is a second case, c , leaving an air-space, c' , between the cases h and c at the ends, sides, and top of the incubator, and there is a third case, b , within the case c , and this case b is the incubator proper, and contains the eggs in trays or baskets, as hereinafter described, and at one side of the incubator there is an opening with a swinging or removable cover, h^2 , Fig. 3, by the opening of which access is given to the incubator to introduce or remove the trays or baskets of eggs.

At one side or end of the apparatus there is a lamp or burner, a , and above this a chimney, a' , and a pipe, a^2 , passing in between the cases b and c , so that heated air and gases from the lamp entering by the pipe a^2 fill the spaces between the cases c and b and heat the incubator, and there are two or more flues, e , passing up vertically through the warm-air space between c and b . These flues e are open at both top and bottom, the upper ends passing through the top of the case h , and the lower end opening into the space between the cases c and b , near the bottom of the incubator. It is now to be understood that atmospheric air will pass into the space between the plates or cases h and c , pref-

erably through holes 8, at the bottom parts of the sides or ends of the incubator, and the same will gradually rise and pass between the top of the case h and the top of the case c , and it will be warmed by the heat of the case c , and then the air passes down through the pipe k into the case b , within which are the baskets containing the eggs to be hatched, as hereinafter described. The warm air gradually displaces the air within the case b , and the air is changed by a portion thereof passing off through the tubes e' into the external atmosphere. The lower ends of these tubes e' are above and open into the drawers v , hereinafter described, and the heated air passes down between the eggs in the egg-baskets, and then into said drawers and away by the tubes e' .

I apply within the incubator, and preferably upon the top of the case c , a water-holding vessel, g , which is shallow and broad, and within this vessel is a short conical cover, g^2 , and this is suspended by rods g^3 , that pass through holes in the top of the case h . By raising or lowering the conical cover g^2 more or less of the surface of the water in the vessel g is exposed to the action of the passing currents of air, and hence the apparatus can be adjusted so as to cause the air to take up the desired quantity of moisture in its passage into the incubator. If the atmosphere becomes too moist, the conical cover is raised to shield the water from the passing current of atmospheric air, and if the air in the incubator is not moist enough this shield is to be lowered. It is important that the water in this vessel g be maintained at a uniform level. To effect this, I make use of a fountain, g^4 , similar to the oil-fountain in a student-lamp, the same being filled and inverted, so that the neck of the fountain passes down to the water-line in the vessel g . By this means air will pass into the fountain and water will run out whenever the level of water in the vessel g lowers by evaporation so as to sink below the end of the fountain-neck. I apply a spring, g^5 , below the body of the fountain, and the same is only of sufficient strength to lift the fountain when empty, or nearly so; hence the position of the fountain will indicate when it requires a fresh supply of water.

The lamp or heater a made use of by me is

of any ordinary construction; but I prefer to use a burner with two separate wicks, one or both of which may be used, according to the temperature of the apartment in which the incubator is operated. I pass through the pipe a^2 whatever proportion of heated gases may be required for maintaining the desired temperature in the incubator, allowing the remainder of the gases to escape into the external atmosphere. To regulate this action according to the temperature, I make use of a coil of pipe, as at l , the same containing glycerine or other liquid introduced at one end into a cup, l^3 , and confined by an adjusting-screw, l' , and at the other end is a vertical tube, n , containing a piston or float, n' , which, with its rod n^4 , acts upon the lever m , and at the lamp-chimney there is a valve, m^2 , suspended from the lever m for regulating the extent of opening between the lamp and the external atmosphere. When the temperature of the incubator increases, the liquid in the thermostat expands and raises the piston n' , and by the lever m lowers the valve m^2 , allowing more of the products of combustion of the lamp to pass into the external atmosphere and less into the incubator, thus lowering the temperature of the incubator. The reverse action takes place when the temperature in the incubator becomes lower. By this means a proper quantity of heat can be passed from the lamp into the space between the cases b and c and the surplus heat allowed to escape. I may have two lamps—one at each end of the incubator; but usually one will be sufficient. The expansion-coil l should be within the chamber b ; but it might be between the cases b and c .

I will now describe the means made use of by me for holding the eggs and turning them over from time to time. I make use of a range of egg-baskets, as at F , these baskets being within the hatching or incubator case b . Each basket is made of two parts. Each part consists of a rectangular frame, S , the inner faces of the frame having offsets or being grooved longitudinally to receive the ends of the V-shaped strips of metal r . The eggs are to be laid upon every alternate pair of these V-shaped strips in one of the half-baskets until the said half-basket is full. Then the upper half-basket is placed upon the lower half-basket, and both placed into the skeleton frame or holder t , next described.

I provide in the lower part of the case b a turner upon a longitudinal axis. Such turner is composed of the skeleton frames t , adapted to receive the egg-baskets slipped in laterally, such skeleton frames being preferably made of L-shaped sheet-metal strips united together and to the central axis or shafts t' , upon which the turners can be revolved by a crank or handle, t^2 , at one end. Beneath the turners there are drawers v , supported in fixed slides. There are as many drawers as there are turners, and these drawers slide in close

up below the egg-baskets, and the turners cannot be revolved until the drawers are partly withdrawn or removed. These drawers should have a lining of soft material, the object of their use being to receive the young chickens as they escape from the eggs. The drawers are to be drawn out periodically, and the turners partially revolved, so as to reverse the positions of the eggs, and as the chickens hatch out and drop into the drawers they can be removed and cared for separately from the incubator.

I prefer to use a lamp with a removable fountain, a^5 , such as found in a student-lamp, so as to maintain uniformity in the level of the oil at the wick. I place below the fountain a spring, a^6 , to raise it, so that when the oil is exhausted the fountain will be lifted and indicate the need of fresh oil.

In order to increase the capacity of the incubator, I provide supports at v^2 to receive a second range of egg-baskets, (shown by dotted lines in Fig. 1;) but when this second range is used the eggs are to be turned by removing the baskets from their holders, inverting them, and replacing them in said holders, and the shafts and cranks t^2 are not required.

I claim as my invention—

1. The combination of the cases b , c , and h , forming intermediate air-spaces, with the ventilating-pipes e , the lamp or heater a , and the pipe a^2 , that passes the heated products of combustion into the air-space between the cases b , c , substantially as set forth.

2. The combination, in an incubator, of the cases b , c , h , ventilating-flues e , lamp a , and heating-pipe a^2 , passing in between the cases b , c , the air-pipe k , passing through such cases b , c , and a water-vessel, g , substantially as set forth.

3. The combination, with the cases b , c , h , of a water-vessel in the air-space between the cases c , h , a conical cover, and adjusting device to regulate the extent of surface from which evaporation takes place, and a water-supplying fountain, substantially as set forth.

4. The combination, with an incubator-chamber and its surrounding cases, of a heater, a vertical flue or chimney for the same, a lateral flue passing from the chimney into the heating-space around the incubator-chamber, a valve within the upper end of the chimney, closing upwardly, to cause the heat to pass into the heating-chamber, and a lever and a thermostat within the incubator, for actuating the valve, substantially as specified.

5. The egg-baskets formed of two frames with slats of bent metal to support the eggs, in combination with the turners, formed as frames, into which the baskets are inserted, and the shafts or axes on which such turners are revolved, substantially as set forth.

6. The combination, in an incubator, with the egg-baskets and the turner-frames into which they are inserted, of the drawers placed

below the turners and the frames or slides
for supporting the parts, substantially as speci-
fied.

5 7. The combination, with the incubator, of
a water-holding vessel, a conical cover, and
adjusting device to regulate the extent of sur-
face from which evaporation takes place, and
a water-supplying fountain, substantially as
set forth.

Signed by me this 28th day of May, A. D. 1885.

WALTER Y. COWL.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.