

964,467.

A. ESSIG.
INCUBATOR.
APPLICATION FILED MAY 6, 1909.

Patented July 12, 1910.

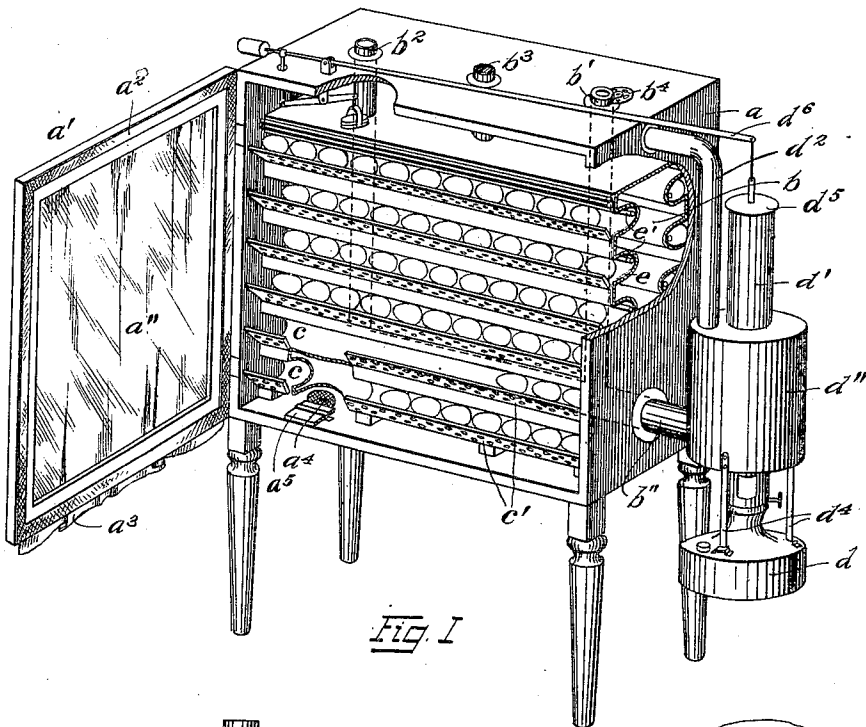


Fig. I

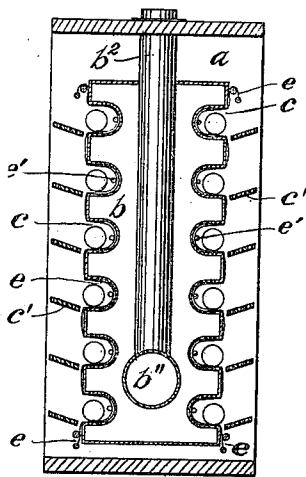


Fig. II

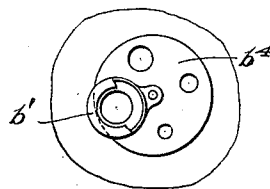


Fig. III

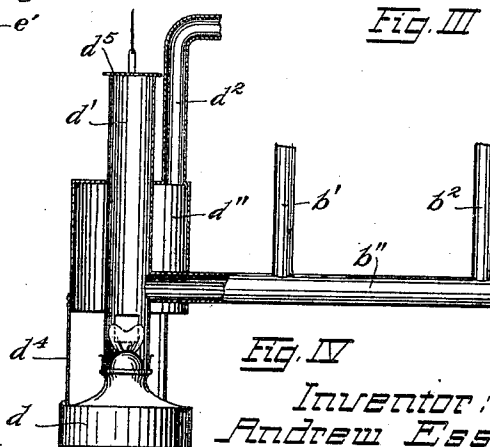


Fig. IV

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UNITED STATES PATENT OFFICE.

ANDREW ESSIG, OF CLEVELAND, OHIO.

INCUBATOR.

964,467.

Specification of Letters Patent. Patented July 12, 1910.

Application filed May 5, 1909. Serial No. 494,077.

To all whom it may concern:

Be it known that I, ANDREW ESSIG, a citizen of the United States of America, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Incubators, of which the following is a specification.

My invention relates to improvements in incubators, and has for its object certain advantageous features of construction, which are explained somewhat in detail in connection with the drawings, and are particularly set forth in the appended claims. The more important of these features may be briefly described as comprising a tank adapted to contain a body of water, used as the principal heat-carrying medium, with which tank are associated suitably regulated flues for transmitting and regulating the heating effect, and recessed or channeled side walls for retaining and inclosing the rows of the eggs during incubation. Associated with said recessed tank, which preferably is mounted in vertical position, so that both sides thereof may be utilized for receiving the eggs, there are provided continuous coverings of fabric, whereon the rows of eggs rest, and by which they are turned within the incubator.

Associated with the lamp or suitable heating medium, is a drum connected with the upper portion of the incubator and affording the same a supply of freshly heated air from the exterior, to maintain a downward circulation within the incubator.

The tank in question and the interior of the incubator are made accessible by doors on either side, which may be provided with glass panels for the observation of the interior, and over these doors are placed curtains of suitable material for preventing the radiation of heat.

The foregoing, together with other features of construction, will be explained at some length in connection with the accompanying drawings, wherein:—

Figure I is a perspective view of an incubator constructed in accordance with my improvements, wherein certain portions are broken away and shown in dotted lines, better to illustrate the features thereof. Fig. II is a transverse section, showing the features of the lateral channel or recessed tank, and means for turning the eggs therein. Fig. III is a detail illustrating the remov-

able slide for controlling the orifice of the nearer flue; and Fig. IV is another detail showing the lamp and portions of the ventilating system.

Throughout the several figures of the drawings, I have employed the same character of reference to indicate similar parts.

The principal features of construction will be more readily gathered by referring to the perspective view, Fig. I, wherein the parts are sectionally broken away, and one of the doors is shown open, better to illustrate the details of my improved incubator. Within the boxlike casing *a*, is provided a tank *b* of peculiar construction, which is adapted to form a nest for the eggs under incubation, and serves to transmit the requisite heat for developing the germs. In order to increase the efficiency, and accordingly the percentage of chicks hatched, I have provided a vertical tank, containing a transverse and two vertical inner flues *b'*, *b''*, *b²*, which are connected with the lamp *d*, and serve to maintain the desired temperature of the water within the tank. Extending across both vertical faces or side walls of the tank, are channels *c*, which are slightly higher than the short diameter of the egg, so that the eggs may be inclosed upon three sides by the walls of the tank. There are six of these channels on either side of the tank in the incubator shown herewith, and before each of these channels, I preferably provide a perforated guard or shelf *c'*, which will prevent the eggs from being displaced.

Lining the several channels is a continuous strip of fabric *e*, retained in place rearwardly of each channel by means of a wire or strip *e'*, and as this fabric extends rearwardly of the shelves *c'*, and the eggs rest directly upon the fabric against the lower horizontal faces of the channels, it is seen that by pulling the ends of the fabric *e* from top or bottom, will serve to turn the eggs within the channels as is frequently required during incubation. The door *a'* preferably has a peripheral strip of felt *a²* along its edge, and a glass panel *a''* may be inserted within the door frame, in which event there preferably is provided a heavy curtain *a³*, exteriorly of the door for checking radiation through the glass. Thus an observation incubator is readily provided. However, as the heat is equally distributed by the fluid within the tank, which is subject

to slight variation, and the eggs are so completely inclosed, their temperature is maintained more uniform than in any incubator with which I am acquainted. Heat is imparted therein naturally by direct contact.

In order to effect the more ready distribution of the heat, I preferably restrict the opening of the nearer flue b' , as by the movable slide b^4 , so that approximately equal volumes of heated air and gas from the lamp will find exit through these flues or chimneys b' b^2 . The central capped opening b^3 enables the contents of the tank to be replenished from time to time.

In order to afford free circulation of freshly heated volumes of air within the incubator, I preferably surround the chimney d' of the lamp d , with a drum d'' open from the bottom and connecting with the top of the incubator casing by means of a pipe d^2 . By this means freshly heated air is constantly supplied at the top of the incubator, and the temperature not only is equalized thereby, since the tank itself is a trifle more highly heated at the bottom, but the depleted air finds constant exit through gauze-covered openings a^4 in the bottom of the incubator casing.

The burner section of the lamp is attached to the drum by means of spring clips d^4 , so that the former may be readily removed for filling the fount or trimming the wick.

The usual thermostatic means may be employed for intermittently lifting the cover d^5 from the chimney immediately the desired temperature is exceeded, through the medium of the weighted lever arm d^6 .

Consideration of the foregoing will prove convincing that the eggs, being maintained at a more uniform temperature, surrounded upon three sides as they are by a relatively large body of fluid, will hatch a larger percentage of chicks, than in the ordinary types of incubator. Moreover, the fluctuations of temperature are further minimized by reason of the employment of the system of freshly heated air for ventilating, in conjunction with the incubating tank, while the eggs may be readily turned from time to time, by moving the supporting fabric at either side of the tank, and without danger of breakage or cooling the eggs, as when they require individual handling.

Accordingly, I desire to claim my improvements set forth; omitting those details which are desirable only for explaining the structure shown, and pursuant to the statutes specify the following as comprising my invention:—

1. In an incubator, the combination with an exterior casing, of a fluid-receiving tank vertically positioned therein, recesses or channels provided in the side-walls of said tank below its normal fluid-level, for receiving and inclosing the eggs, and means for

heating the fluid contents of the tank, substantially as set forth.

2. In an incubator of the class described, the combination with an exterior casing, of an interiorly positioned fluid tank vertically mounted therein, a plurality of channels in the side-walls of said tank for receiving and inclosing the eggs under incubation, a body of fluid within the tank, and means for maintaining the fluid approximately at a predetermined temperature, substantially as set forth.

3. In an incubator of the class described, the combination with an exterior casing, of an interiorly positioned fluid tank vertically mounted therein, a plurality of channels in the side-walls of said tank for receiving and inclosing the eggs under incubation, a body of fluid within the tank, a ventilating system for providing a freshly heated supply of air to the interior of the incubator casing, and means for maintaining the fluid approximately at a predetermined temperature, substantially as set forth.

4. In an incubator, the combination with a vertically positioned tank having recessed channels in its side walls below the fluid level of the tank, adapted to receive the eggs, of means for heating the fluid contents of the tank, perforated shelves extending across the outer face of the tank adjacent to said channels; said shelves forming guards to prevent displacement of the eggs and supports for the chicks when hatched, an exterior casing, and means for ventilating the interior of the casing from above transversely of the shelves, substantially as set forth.

5. In an incubator, the combination with an exterior casing, of a vertically positioned fluid-containing tank therein having recessed channels in its side walls adapted to receive and inclose the eggs during incubation; said channels lying below the fluid-level of the tank, interior flues extending through the tank, and automatically controlled exterior means for supplying heated air to said flues and to the upper portion of the casing for ventilating the same, substantially as set forth.

6. In an incubator, the combination with an exterior casing, of an inner vertical tank and transverse channels provided in both side-walls thereof for receiving and inclosing the eggs, interior flues within the tank, and a lamp connected therewith for heating the tank-contents and incubating the eggs, substantially as set forth.

7. In an incubator, the combination with an exterior casing, of an inner vertical tank and transverse channels provided in both side-walls thereof for receiving and inclosing the eggs, interior flues within the tank, a ventilating system connected with the upper portion of the casing, and a lamp asso-

ciated with the flues and ventilating system for heating the tank-contents and supplying freshly heated air to insure circulation within the incubator, substantially as set forth.

5 8. In an incubator, the combination with a vertically positioned fluid-receiving tank having egg-receiving channels in its side walls below the normal fluid-level, adapted to contain the eggs during incubation, of
10 means for heating the fluid contents of the tank, and an exterior casing with doors at either side, inclosing said tank while affording access to the incubated eggs, substantially as set forth.

15 9. In an incubator, the combination with a tank, of a plurality of channels provided in the side-wall for receiving and inclosing the eggs, a substantially continuous and movable strip of fabric lining said channels,
20 whereon the eggs rest and are adapted to be turned by the movement of the fabric, and means for heating the tank-contents, substantially as set forth.

10. In an incubator, the combination with a fluid-containing tank having recessed
25 channels in its walls to receive the eggs, of a longitudinally movable strip of fabric lining said channels, whereon the eggs normally rest, means for retaining the fabric within the channels to avoid displacement
30 of the eggs, and additional means for maintaining an incubating temperature in said tank, substantially as set forth.

11. In an incubator, the combination with an exterior casing, of a suitable heating ap-
35 pliance, a fluid-containing tank associated therewith; said tank having channels or depressions for receiving and inclosing the eggs, and a movable fabric lining for said
40 channels, substantially as set forth.

Signed at Cleveland, Ohio this 30th day of April, 1909.

ANDREW ESSIG. [L. s.]

Witnesses:

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