No. 832,395. PATENTED OCT. 2, 1906.

G. H. LEE.

INCUBATOR.

APPLICATION FILED OCT. 16, 1905.

2 SHEETS—SHEET 1.

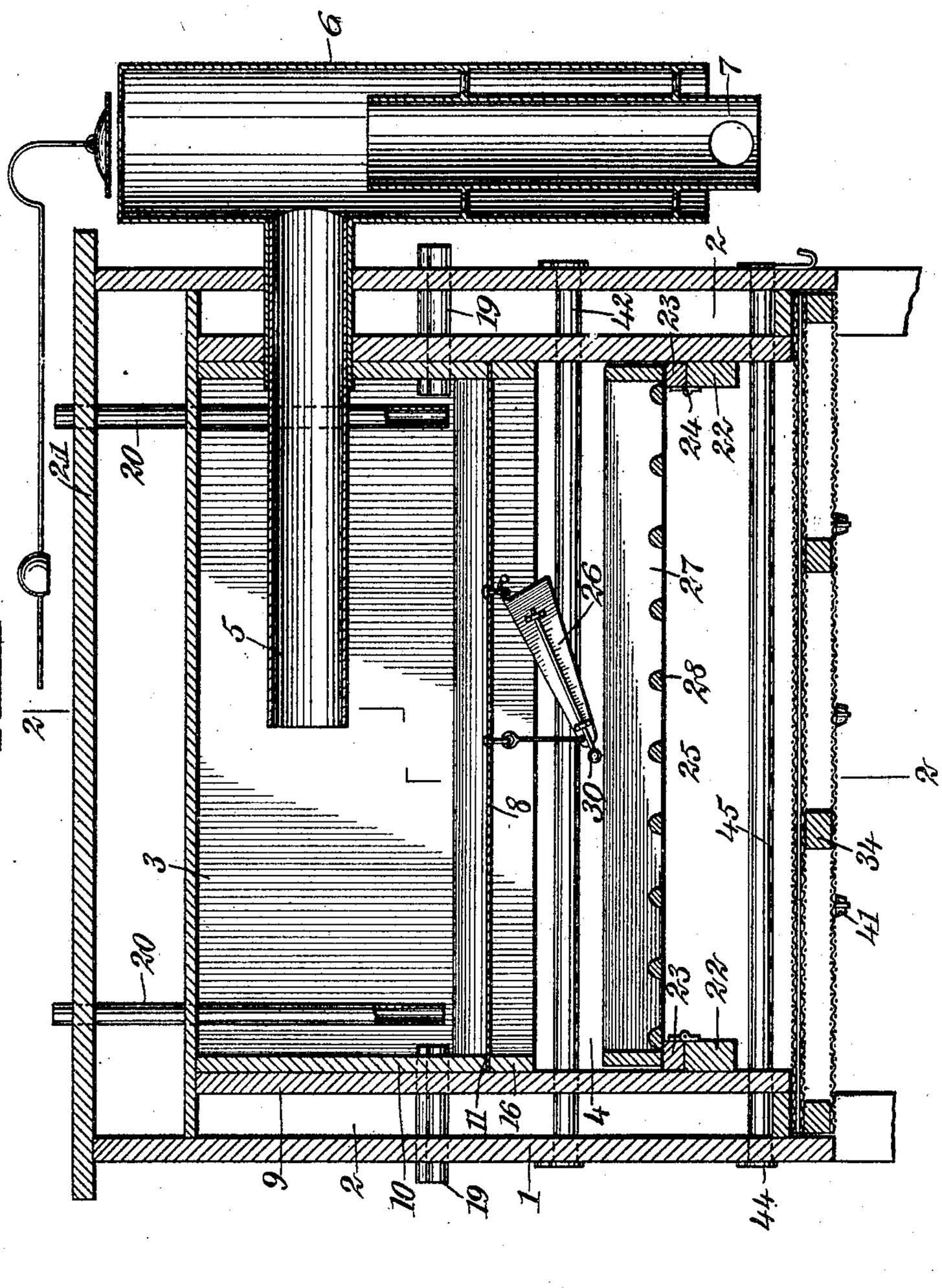

FIG. 1.

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2 SHEETS—SHEET 2.

Fig. 2

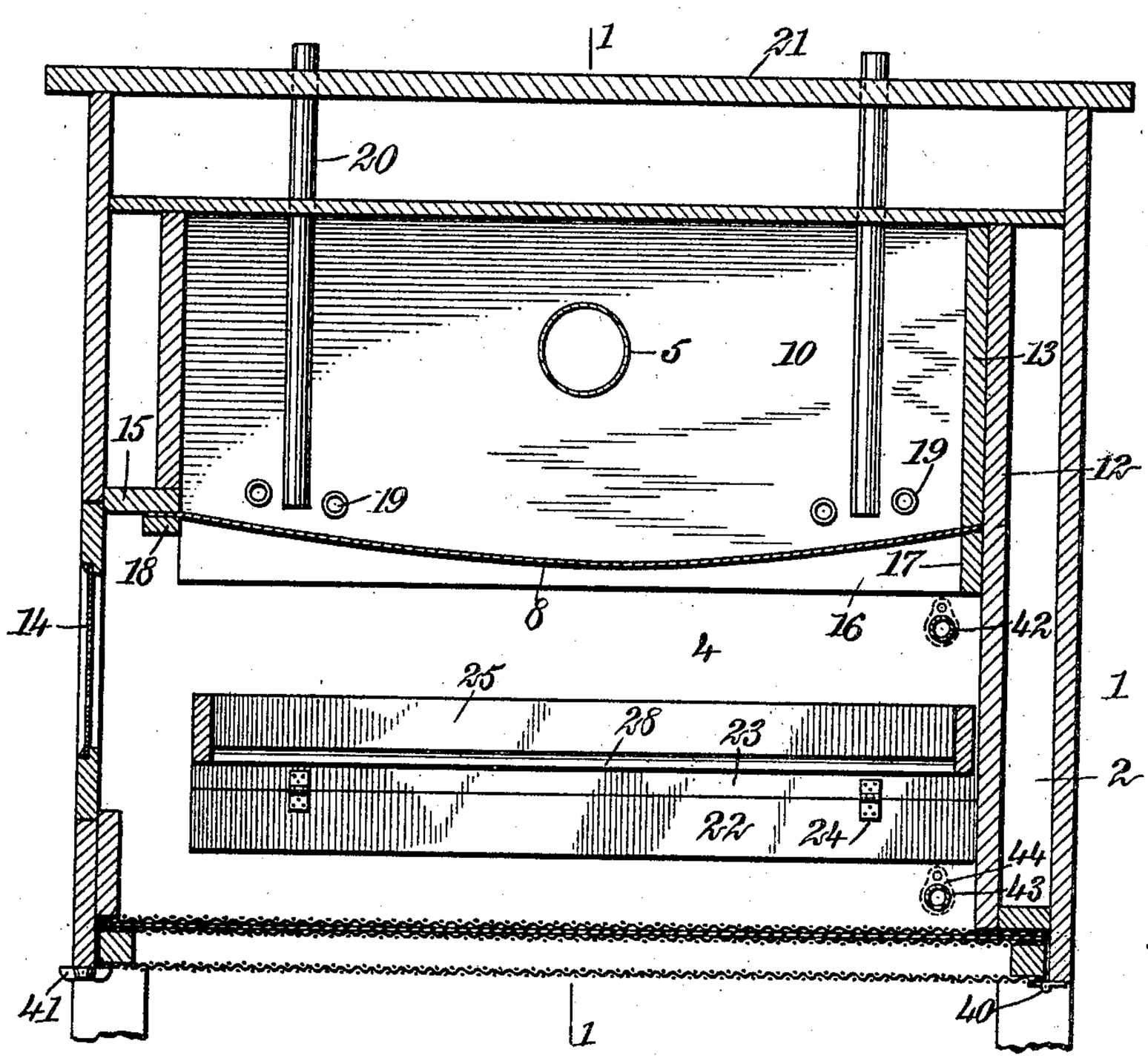
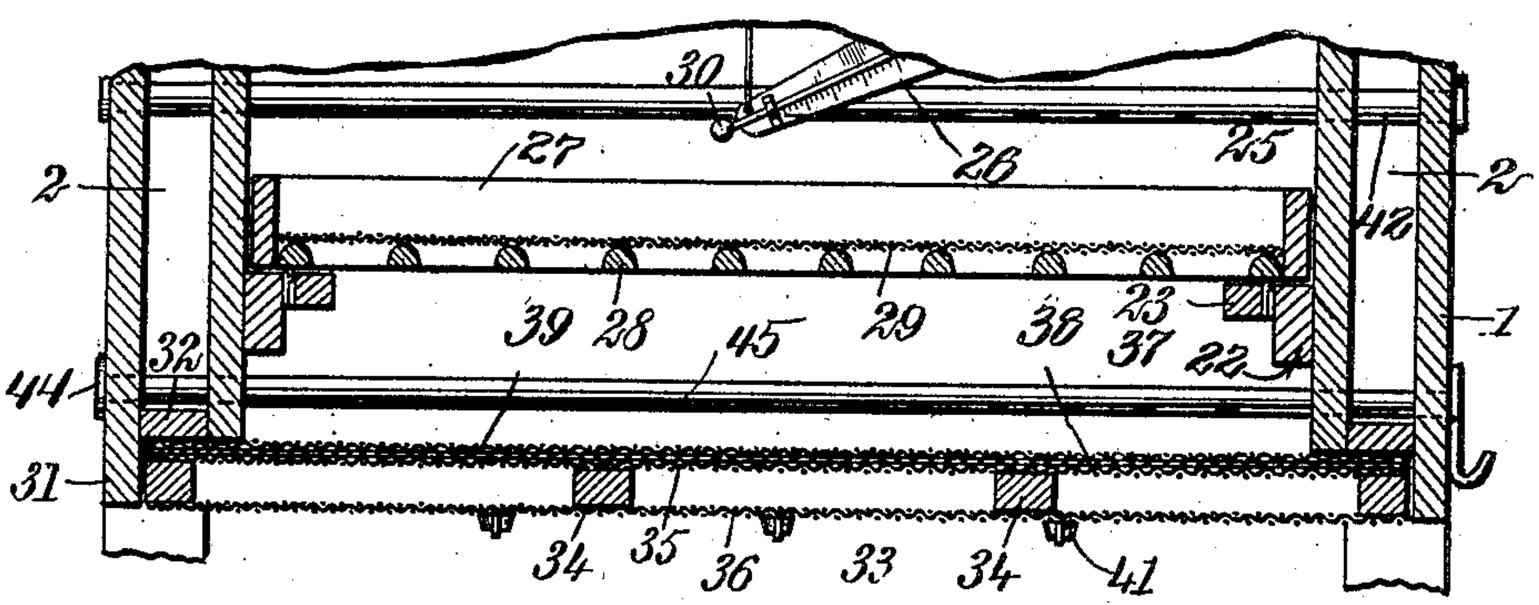


Fig. 3



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GEORGE HOWARD LEE, OF OMAHA, NEBRASKA.

INCUBATOR.

No. 832,395. Specification of Letters Patent. Patented Oct. 2, 1906.

Application filed October 16, 1905. Serial No. 282,980.

To all whom it may concern:

Be it known that I, GEORGE HOWARD LEE, a citizen of the United States, and a resident of Omaha, in the county of Douglas and State of Nebraska, have invented a new and Improved Incubator, of which the following is a full, clear, and exact description.

This invention relates to incubators.

The object of the invention is to produce an improved construction for the egg-tray, so as to adapt the same especially to the requirements of different periods of the incubation.

A further object is to provide an improved arrangement for supporting the tray on the body of the incubator and to improve the means of heating the heating-chamber.

The invention consists in the construction and combination of parts to be more fully described hereinafter and definitely set forth in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

In the drawings, Figure 1 is a substantially vertical central section through the incubator on the line 1 1 in Fig. 2, the supports therefor being represented as broken away. Fig. 2 is a transverse section taken on the line 2 2 in Fig. 1; and Fig. 3 is a section taken in the same plane as Fig. 1, but representing only the lower portion of the incubator-body.

Before proceeding to a detailed description of the invention it may facilitate the disclosure to state that incubator users recognize advantages of egg-trays having slatted bottoms during the hatching period, while at the same time the advantages of a screen-bottom for the egg-tray are admitted for other periods of the incubation. I provide a simple arrangement whereby the advantages of both these forms of tray may be combined in one. I may state further that it is customary for incubator users to tack a sheet of burlap or similar material on the incubator-floor, and this burlap is usually removed from time to time, generally immediately after the hatching-time. I provide means for securing in position a removable covering for the floor.

Referring more particularly to the parts, 1 represents the body of the incubator, which may be of the usual box form, having double walls 2. Within this body, in the upper portion thereof, there is formed a heating-chamber 3 and in the lower portion an egg-chamber 4. Heated air and gases are supplied to the heating-chamber 3 by means of a suitable flue 5, which leads horizontally from a hood 6, arranged over the usual lamp-chimney 7. It should be understood that in practice a lamp is placed under the chimney 7 and the heated gases pass into the upper portion of the hood, from which they find their way from the flue 5 into the heating-chamber. The current in the upper portion of the hood of course induces an upward flow of air in the hood surrounding the chimney, and this air is of course mixed with the gases of combustion from the lamp and also heated by contact with the walls of the hood, chimney, and flue and is then delivered also through the flue 5 into the interior of the heating-chamber.

The heating-chamber is separated from the egg-chamber by means of an air-tight diaphragm 8, preferably formed of some suitable sheet metal, such as steel or galvanized iron. This diaphragm is preferably curved so as to present its convex side downwardly, as indicated most clearly in Fig. 2. On the end walls 9 of the incubator-body I attach end pieces 10, the lower edges 11 whereof are curved, as shown, so as to conform to the curvature of the diaphragm. These end pieces substantially cover the inner faces of the walls of the heating-chamber. The rear wall 12 of the incubator-body is provided with an inner back 13, which substantially covers the rear wall of the heating-chamber, as shown.

At the front of the incubator the usual door 14 is provided, which facilitates access to the egg-chamber, and near the upper edge of this door a longitudinally-disposed lintel 15 is arranged. The diaphragm 8 is applied to the under side of this lintel 15, with its rear edge lying against the lower edge of the backing-piece 13, while its side edges lie against the lower edges 11 of the end pieces 10.

By means of suitable end cleats 16, curved on their upper edges, the end edges of the diaphragm are rigidly secured against the edges 11. A backing-cleat 17 is provided, which holds the rear edge of the diaphragm against the under edge of the backing-piece 13, the said cleat being attached to the rear wall 12, as shown most clearly in Fig. 2. The forward edge of the diaphragm 8 rests, as stated, against the under face of the lintel 15, and at this point the diaphragm is secured by means of a suitable cleat 18, attached to the under side of the lintel, as shown.

From this arrangement it should be understood that the egg-chamber is effectually cut off from the heating-chamber and so that, in effect, an air-tight partition is formed therebetween. I provide an outlet for the heated gases from the heating-chamber. For this purpose in the lower portion of the heating-chamber short horizontal tubes 19 are arranged to pass through the end walls of the body, as indicated. These tubes project slightly beyond the body on the outer side and also project only a short distance into the interior of the heating-chamber. I prefer to arrange these tubes near the diaphragm and as indicated most clearly in Fig. 2.

In addition to the horizontal tubes 19 I provide vertical tubes 20, which extend down through the cover 21 of the incubator-body, terminating near the diaphragm 8 between the tubes 19. In this connection it should be observed that the tubes 19 are preferably disposed in two pairs located, respectively, at the front and rear of the body, and the tubes 20 terminate, preferably, in the space between the axes of the tubes of each pair.

At a suitable distance below the diaphragm 8 the end walls of the incubator-body are provided with horizontal cleats 22, which are attached to the inner faces of the end walls, as shown most clearly in Fig. 1. Near the upper edges of these cleats 22 battens 23 are attached by means of hinges 24. From this arrangement the battens may be turned down into the position shown in Fig. 3, enabling an egg-tray 25 to be supported upon the upper faces of the cleats, or the egg-tray may be supported upon the upper faces of the battens when resting upon the upper faces of the cleats, as shown most clearly in Fig. 1. This arrangement is adopted for the purpose of adjusting the height of the egg-tray with respect to a thermometer 26, which is preferably suspended from the under side of the diaphragm, as indicated most clearly in Fig. 1.

The egg-tray 25 consists of a frame 27 of substantially rectangular form, provided with transverse bars 28, which constitute a bottom therefor. Upon the upper faces of the bars 28 a removable sheet 29, of wire-gauze or similar material, is placed, as indicated in Fig. 3, and upon this sheet the eggs rest during the principal portion of the incubating period. When, however, the hatching time has arrived, I remove the sheet 29 and allow the slats or bars 28 to support the eggs, it being understood that the eggs will rest in rows between the slats in the usual manner. However, it should be understood that when the slats are supporting the eggs between them the egg-tray will not operate to support the eggs in as elevated a position as before, and in order to raise the tray, so as to support the eggs in their normal or former position, I provide the battens 23. As indicated in Fig. 1, when these battens are resting on the upper faces of the cleats the egg-tray will be supported in an elevated position, raising the eggs, as will be readily understood, so that they are at substantially the same distance from the thermometer-bulb 30 as before. It should be understood that the barred floor for the tray is especially advantageous at the hatching-time, for the reason that it facilitates the breaking of the shell by the weight of the chick and also effects a separation of the hatched chicks from the unhatched eggs, as the chicks immediately fall through into the space below the tray, which then constitutes a nursery. In this nursery the heat is not so great, and the chicks can run about until they become dry.

The construction of the incubator-bottom will now be described. In this connection I prefer to extend the outer wall of the body beyond the inner walls, so that projecting lower edges 31 are presented, as indicated most clearly in Fig. 3. Flush with the lower edges of the inner walls I provide sills 32, which bridge the space between the walls, as shown. In this way the sills 32 and the lower edges of the inner walls constitute depressed shoulders formed on all sides of the incubator-body. The bottom of the incubator consists, preferably, of a rectangular frame 33, which may be provided, if desired, with transverse braces 34. To the upper and lower faces of this frame I attach sheets of cloth 35 and 36. Upon the upper cloth 35 I place a removable carpet or cover 37, which preferably consists of a sheet of cardboard 38 or similar material laid below a sheet of burlap 39 or similar material. It should be understood that the edges of the frame 33 lie adjacent to the inner faces of the projecting edges 31 of the outer wall of the body, as indicated most clearly in Fig. 3. The carpet 37 substantially covers the upper face of the frame, so that when it is laid thereupon and the frame moved upwardly into position the edges of the frame operate to clamp the edges of the carpet against the under faces of the sills or shoulders 32. From this arrangement it is entirely unnecessary to fasten the carpet to the floor, and whenever desired the carpet may be readily removed and replaced by a clean one. I prefer to attach the frame 33 to the incubator-body by means of hinges 40, arranged at the rear wall, as indicated in Fig. 2, and support the sides of the frame and the front edge thereof upon turn-buttons 41, as shown.

For the purpose of ventilating the egg-chamber I provide horizontal ventilating-tubes 42 and 43, which extend longitudinally of the egg-chamber near the rear wall thereof, as shown in Fig. 2. One of the tubes is preferably disposed above the egg-tray, while the other is disposed below the same.

These tubes pass through the end walls of the incubator-body, at which point movable shutters or dampers 44 are provided, which may be open more or less to give the amount of ventilation desired. The bodies of the tubes between the end walls are provided on their under sides with a plurality of openings or perforations 45. From this arrangement it should be understood that sufficient air will be supplied to the egg-chamber and nursery without subjecting the interior thereof to drafts.

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

1. An incubator having a body with a heating-chamber formed in the upper portion thereof, said body having end pieces attached to the inner sides of the end walls thereof, and a backing-piece attached to the rear wall thereof, a diaphragm engaging the lower edges of said end pieces and said backing-piece, a lintel at the front wall of said body and against which the forward edge of said diaphragm rests, cleats attached to the end walls and rear wall of said body and abutting the edges of said diaphragm, and a cleat at the under side of said lintel and securing the forward edge of said diaphragm against the same.

2. An egg-tray having a bottom with transverse bars arranged close together to support eggs when resting thereupon, in combination with a removable sheet of stiff material resting upon said bars and adapted to support the eggs at an elevation above the upper edges of said bars.

3. An incubator having cleats adapted to support an egg-tray, and movable battens attached near the edges of said cleats and resting on said cleats to raise the position of said tray.

4. In an incubator, an egg-tray having a bottom composed of transverse bars adapted to support eggs therebetween, a removable sheet supported on said bars and adapted to support eggs thereabove, and means for supporting said egg-tray at different elevations.

5. In an incubator, in combination, a body, an egg-tray presenting transverse bars adapted to support eggs therebetween, a removable sheet which may rest on said bars and adapted to support the eggs above said bars, cleats attached to said body and adapted to support said tray, and movable battens attached at said cleats and affording means for supporting said tray in an elevated position.

6. In an incubator, in combination, a body, cleats therein adapted to support an egg-tray, battens jointed to said cleats and normally lying at the sides thereof, an egg-tray supported on said cleats and presenting transverse bars adapted to support eggs therebetween, and a removable sheet adapted to support the eggs above said bars.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE HOWARD LEE.

Witnesses:
HARRY ROWLEY,
ROSE O'NEIL.