No. 733,270. PATENTED JULY 7, 1903.

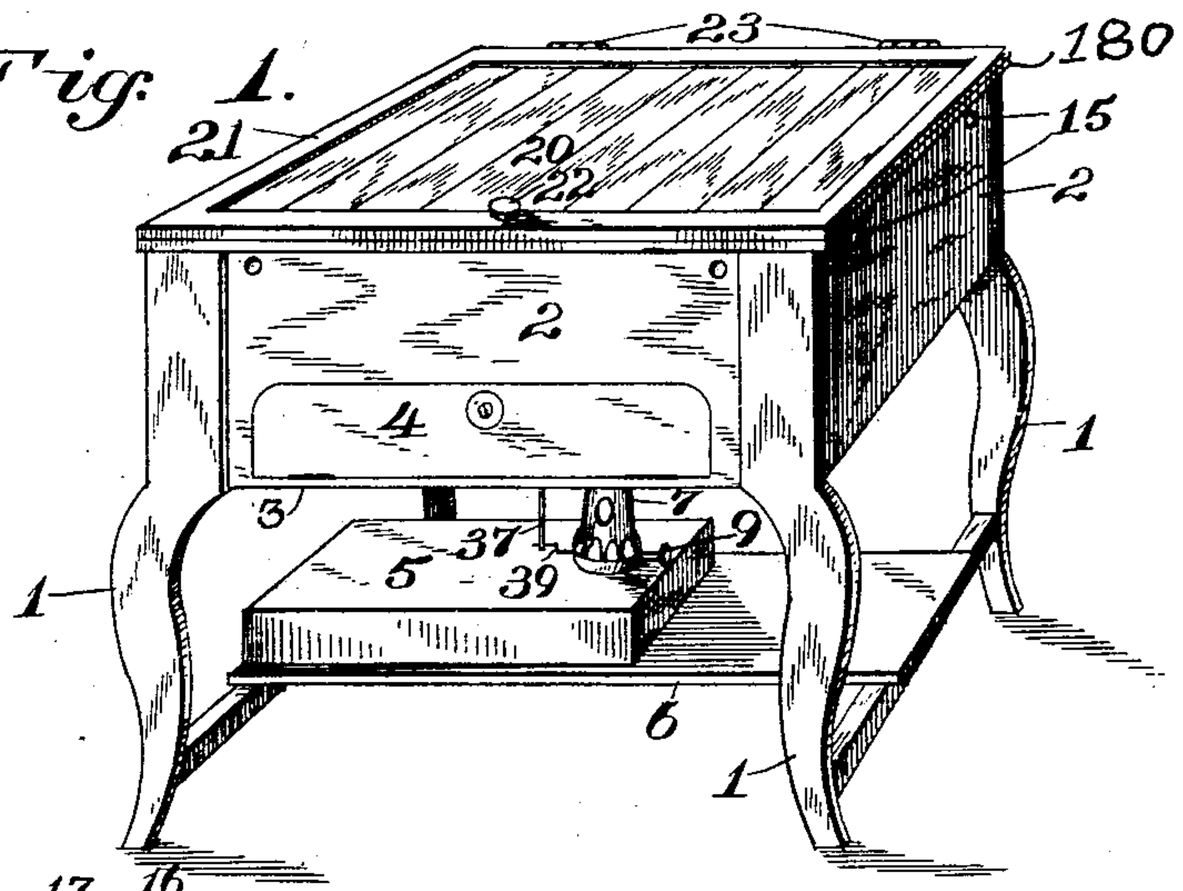
J. W. PORTER.

INCUBATOR.

APPLICATION FILED SEPT. 15, 1902.

NO MODEL.

Fig. 1.



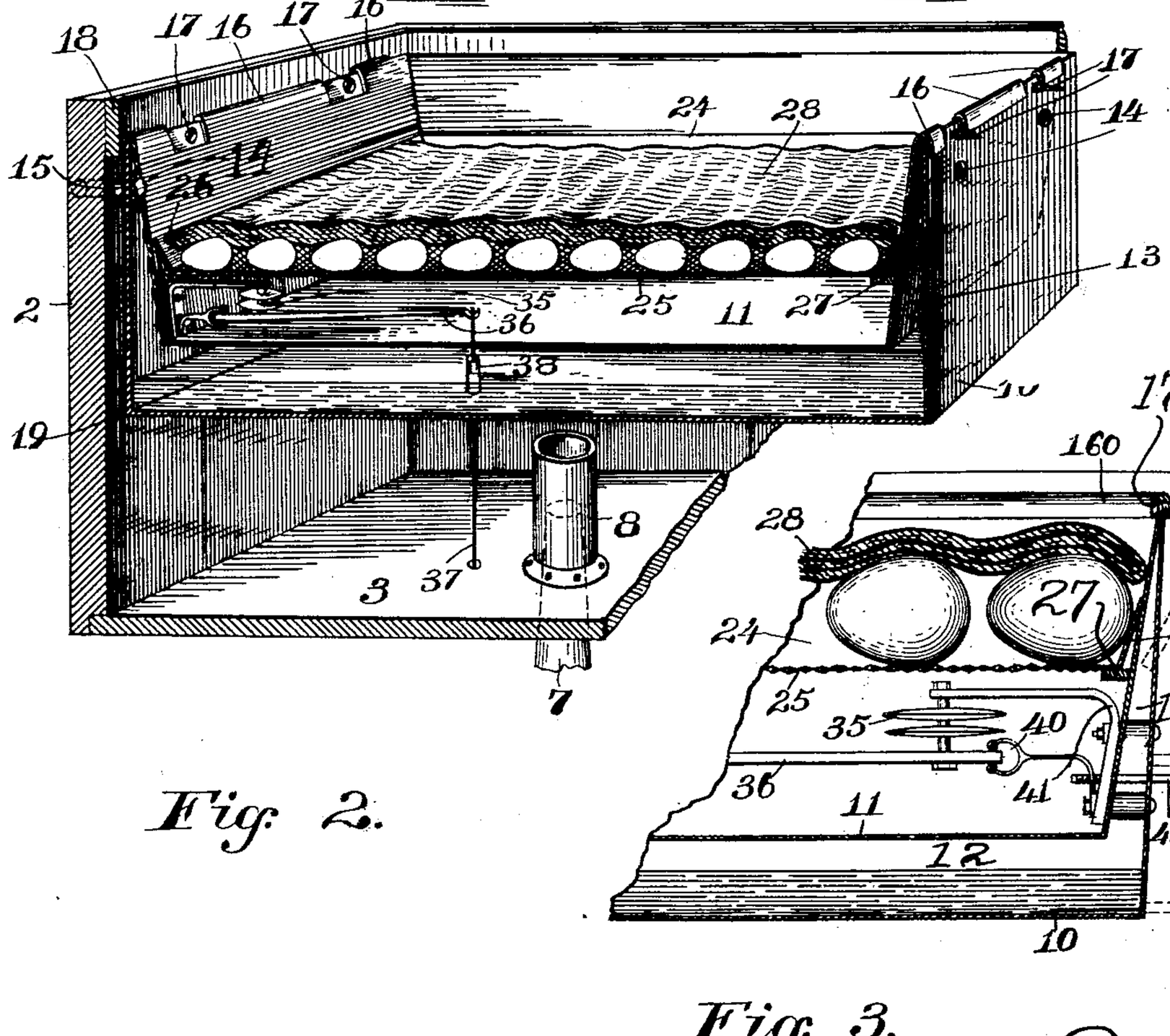


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

JOSEPH W. PORTER, OF PONCA, NEBRASKA.

INCUBATOR.

SPECIFICATION forming part of Letters Patent No. 733,270, dated July 7, 1903.

Application filed September 15, 1902. Serial No. 123,511. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. PORTER, a citizen of the United States, and a resident of Ponca, Dixon county, State of Nebraska, have invented certain new and useful Improvements in Incubators; and my preferred manner of carrying out the invention is set forth in the following full, clear, and exact description, terminating with claims particularly specifying the novelty.

This invention relates to incubators; and the objects of the same are to produce a substantially even temperature in all parts of the egg-chamber and to maintain this temperature, so that the eggs will need no airing or turning, and thus to hatch the eggs by the use of a minimum quantity of heating fluid. These objects I attain by my improved incubator, whose essential principle is an inner or egg case within an outer case or tank, which latter contains a little water, whose level is always below the bottom of the egg-case, and the application of heat beneath the bottom of the tank to produce steam, that heats the bottom and all four sides of the egg-case and escapes near the top, an egg-tray within the egg-case and raised above its bottom, and a blanket over the case proper to retain the heat within the egg-case, together with such details of construction for carrying out this principle as may be necessary.

The following specification describes only one of many forms which this machine may take, and I desire to be understood as intending to cover by the use of the broad terms mentioned herein not merely the constructions shown and described, but any equivalent constructions which will answer.

In the accompanying drawings, Figure I is a perspective view of this machine. Fig. II is a sectional view showing the interior parts in their relative arrangement and somewhat in perspective. Fig. III is a sectional detail which also illutrates some modifications.

In the present instance, 1 represents legs supporting a body 2, closed on four sides and at its bottom 3, which forms the floor of a nursery having a door 4, and which nursery by suitable additions and amplifications, not necessary to illustrate herein, may constitute a brooder.

5 is the lamp-body, and I find if made of sufficient size to contain five quarts of oil it will produce a hatching up to two hundred eggs without the necessity for refilling. The lamp rests on a shelf 6 and has the usual chimney 7, projecting through the floor of the nursery, within which it is surrounded by a flue 8, extending upward almost to the bottom of the heating device, next described. The flame of the lamp is controlled by hand by the usual milled wheel 9, and it may also be controlled by a thermostat, as explained below.

The heating device (best seen in Fig. II) consists of two metallic pans set one within the other after the fashion of the well-known "double boiler," the outer pan tapering a little toward its bottom and the inner pan tapering considerably toward its bottom and being of less depth, so as to produce a space between the bottoms and all the sides of the two pans. The outer pan 10 constitutes the water-tank, and its bottom is preferably flat and stands a little above the upper end of the flue 8. The inner pan 11 constitutes the egg-case. Its preferably flat bottom stands a little over an inch above the bottom of the tank, and the space 12 thus formed between the two is about half filled with water, as shown. When this water is heated, it is converted into steam or vapor, which flows outward beneath the bottom of the egg-case and upward in the annular space 13 around the sides thereof and, if necessary, may be permitted to escape through the outlets 14, which are preferably two holes through the tank 10 at each corner opposite two similar holes 15 in the body 2, making eight outlets in all and so small and so scattered that a draft of air in the room containing the incubator will not affect its successful operation. The two pans may be connected in any suitable way at and around their upper edges. In Fig. II the inner pan has tongues 16, hooking over the upper edge of the outer pan, and screws 17 through the latter take into a strip 18 within the body and by which the outer pan is supported in such way that the inner pan can be lifted out, as for cleansing or repair. In Fig. III these screws 170 pass through the upper edges of both pans (which edges are seamed together, as at 160) and take into a molding strip or frame 180, which surrounds the pans

and rests upon the upper edge of the body. When this frame is raised, both pans are lifted out of the body, as for cleansing or repair. In any event the strip or frame centers the entire heating device within the body in such manner that an annular space 19 exists between them, and the products of combustion passing out the flue 8 and along the bottom of the tank rise upward around all sides of the latter and escape out of the outlets 15. The steam-outlets 14 may be omitted, in which case the steam will be mostly retained within the space 13 or will percolate and escape between the upper edges of the pans, as where the tongues 16 have notches in which stand the screws 17.

The lid or cover 20 is mounted within its frame 21, which has a handle 22 at one side and is hinged, as at 23, at the other side to the upper edge of the body or to the molding-frame 180, by which means this cover may be raised when desired. The eggs rest within a tray 24, having a screen bottom 25, preferably inclosed within a frame 26, which fits within the egg-case at a proper height above its bottom and, if desired, may be supported upon cleats 27.

An important feature of my invention is the fact that a three-ply blanket or thick fabric cover 28 is laid upon the eggs beneath the lid 20, which blanket retains the heat within the egg-case and produces practically the same temperature above the eggs as beneath and on all sides thereof.

Many changes in the details and additions to the structure may be employed. As in Fig. III, a filling-tube 30 may be led inward through the molding 180, by which water can be fed into the tank from time to time when necessary. A water-gage 31 may be provided, as also indicated in this figure, and if so its upper petcock 32 may have a funnel 33, which can be used as a filling means, and its lower petcock 34 may serve as a drain for the tank. Any suitable form of thermostat 35 may be employed, provided it can be adapted to the space allowed and uses necessary, the thermostatic arm 36 carrying a rod 37, which passes downward through a tube 38 in the bottom of the tank and connects with a crank 39, serving to govern the height of the flame. In Fig. III the fulcrum 40 of this arm is supported by a bracket 41 within the egg-case, and the fulcrum itself can be adjusted by a screw 42, leading to the outside of the body and having a hand-wheel 43.

I refrain from giving the operation of the incubator, as it is too well known to need repetition here. The only peculiarities of this machine are that the heat from the "lamp" (by which term I intend to include any suitable heater) warms the "nursery" (this term to include a brooder) and then heats the bottom of the water-tank and escapes through the outlets 15. Within the tank the water (it may be some other liquid, or, in fact, it may be any suitable fluid) is converted into steam or vapor or hot fluid, which warms the bottom of the egg-case and flows upward around the sides thereof, and if it is necessary to have outlets 14 they may be provided where shown or may be otherwise arranged. The egg-tray (any suitable type of tray may be employed, with an egg-turner, if desired, although I do not consider it at all necessary) is preferably supported within the egg-case a little distance above its bottom and a little distance beneath the lid 20, both spaces affording warming-chambers, the space below admitting a thermostat, if employed, and the space above admitting a cover, which is preferably a blanket, as set forth. Such details as the filling-tube and the water-gage form no essential feature of the present invention, and the general arrangement of parts may be varied at will. I will only add that the bottom of the tank 10 should stand about flush with the upper edge of the door 4 and preferably a little higher than small chicks can reach. I have shown no glass panels or doors; but they may be provided to permit inspection of the interior from time to time. The materials and proportions of parts are not essential.

What I claim as new is—

1. In an incubator, the combination with an inclosing body provided with heat-outlets near its top, a heater, and a heat-flue extending through the floor of said body; of nested pans supported within the body, the outermost having a flat bottom raised above said flue and walls spaced from the interior of the said body, and the innermost having its bottom raised above that of the outermost and its walls spaced from the walls thereof on all sides except at their upper edges which contact with the upper edges of the walls of the outermost pan, and devices within the inner pan for supporting eggs.

2. In an incubator, the combination with an inclosing body provided with heat-outlets near its corners at the top, a heater, and a heat-flue extending through the floor of said body; of nested pans supported within the body, the outermost having a flat bottom raised above said flue and side walls spaced from the interior of the said body, and the innermost having its bottom raised above that of the outermost and its side walls spaced from the side walls thereof, said side walls of the outer pan having vapor-outlet openings near their corners and upper edges opposite the openings in the body, and the side walls of the inner pan being connected at their upper edges with those of the outer, and devices within the inner pan for supporting eggs.

3. In an incubator, the combination with two nested pans of which the outermost tapers downward while the innermost tapers downward to a greater degree and has its bottom standing above that of the outermost, connections between the two pans, means for supporting them, and devices for supporting the eggs within the inner pan; of means for

flowing heat along the outer face of the bottom of the outer pan, and a liquid within the space between the bottoms of the two pans.

4. In an incubator, the combination with two nested pans of which the outermost tapers downward and has a flat bottom while the innermost tapers downward to a greater degree and has a flat bottom standing above that of the outermost, connections between the upper edges of the two pans, means for supporting them, and devices for supporting the eggs within the inner pan out of contact with its bottom; of means for flowing heat along the outer face of the bottom of the outer pan and along the outer faces of all its side walls, and a fluid within the space between the bottoms of the two pans.

5. In an incubator, the combination with a rectangular body having a floor and supported by legs, a flue passing through and rising above said floor, a heater directing its heat into the flue but independent thereof, outlets near the top of the body, and a cover; of a pan supported within the body out of contact with its side walls and raised above its floor a greater distance than the height of a chick so as to form a nursery, a door for the latter, and means for supporting the eggs within the pan.

6. In an incubator, the combination with a rectangular body having a floor and supported by legs, a flue passing through said floor, a heater directing its heat into the flue, outlets near the top of the body, and a cover; of nested pans supported within the body out of contact with its side walls with the bottom of the outer pan above said flue and the bottom of the inner pan raised above that of the outer, a tube through the bottom of the outer pan, an egg-tray supported within the inner pan intermediate its depth, a thermostat within the inner pan beneath the tray, and a rod leading from the thermostat through the bottom of the inner pan and through the tube in the outer pan to and adapted to control the heater.

7. In an incubator, a pan closed at its sides and bottom, a water-tank beneath the pan and around and remote from all its sides, means for heating the water, and a lid closing the pan; combined with a support for the eggs within said pan, and a blanket lying over the eggs beneath said lid.

8. In an incubator, the combination with a rectangular body having heat-outlets, and a heater directing its heat through the bottom of the body; of downwardly-tapering nested pans located within said body, the innermost being supported by the outermost, a frame resting on the upper edge of the body and to which the outermost pan is secured, and a lid.

9. In an incubator, the combination with a rectangular body having heat-outlets, and a heater directing its heat through the bottom of the body; of nested pans located within said body, the innermost being supported by the outermost, a frame resting on the upper edge of the body and to which the outermost pan is secured, a second frame resting upon and hinged to the first, and a lid carried by this second frame.

10. In an incubator, the combination with a body having a floor, a liquid-containing pan supported therein above the floor a distance greater than the height of a chick, and an egg-tray above the bottom of the pan; of means for applying heat to the liquid, and means for permitting access to the space beneath the pan and floor whereby such space serves as a brooder or nursery.

In testimony whereof I have hereunto subscribed my signature this 10th day of September, A. D. 1902.

JOSEPH W. PORTER.

Witnesses:
M. I. MELLON,
CHAS. C. AUGE.