

No. 774,076.

PATENTED NOV. 1, 1904.

W. H. HUGHES.
INCUBATOR.

APPLICATION FILED MAY 3, 1904.

NO MODEL.

3 SHEETS—SHEET 1.

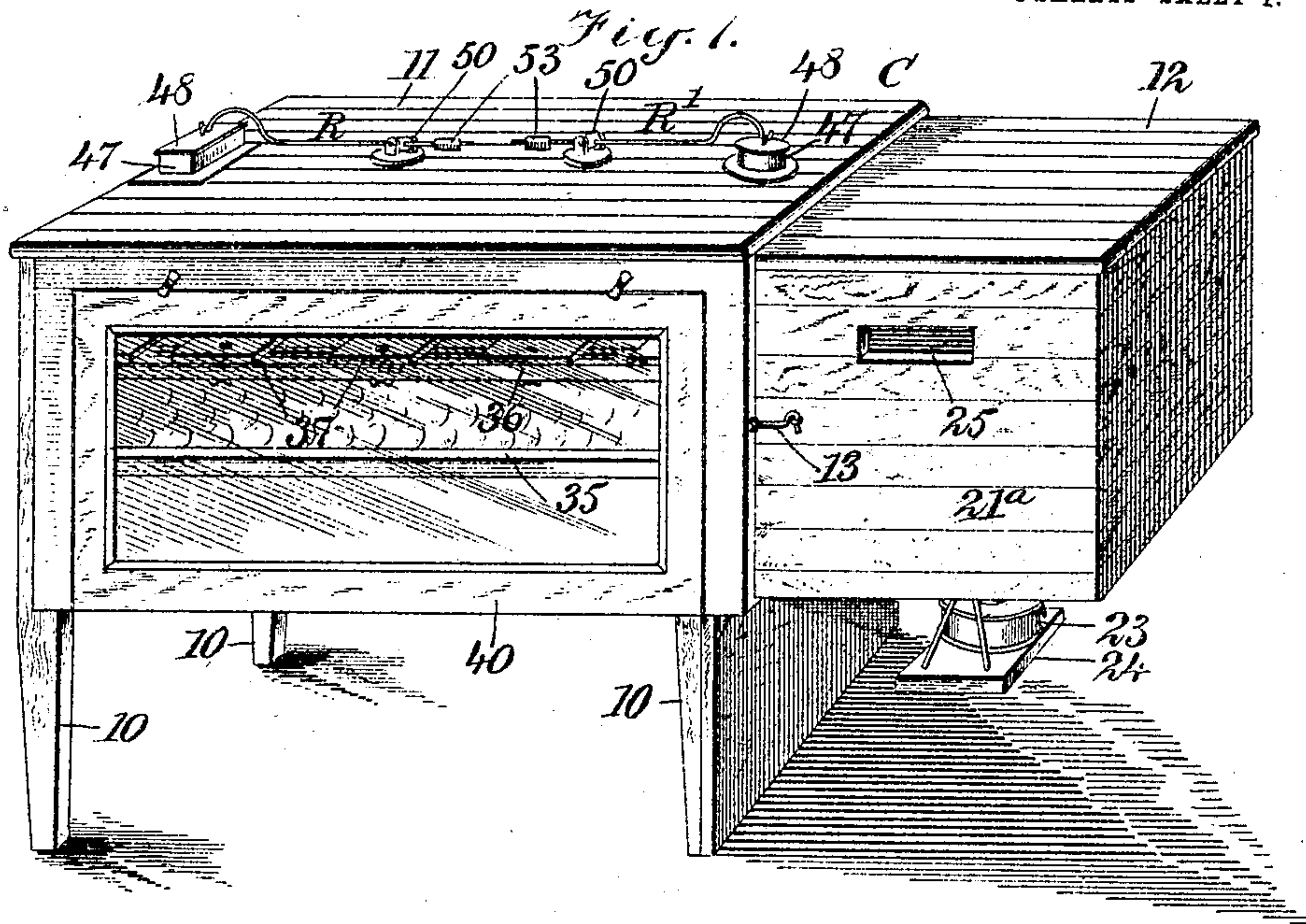
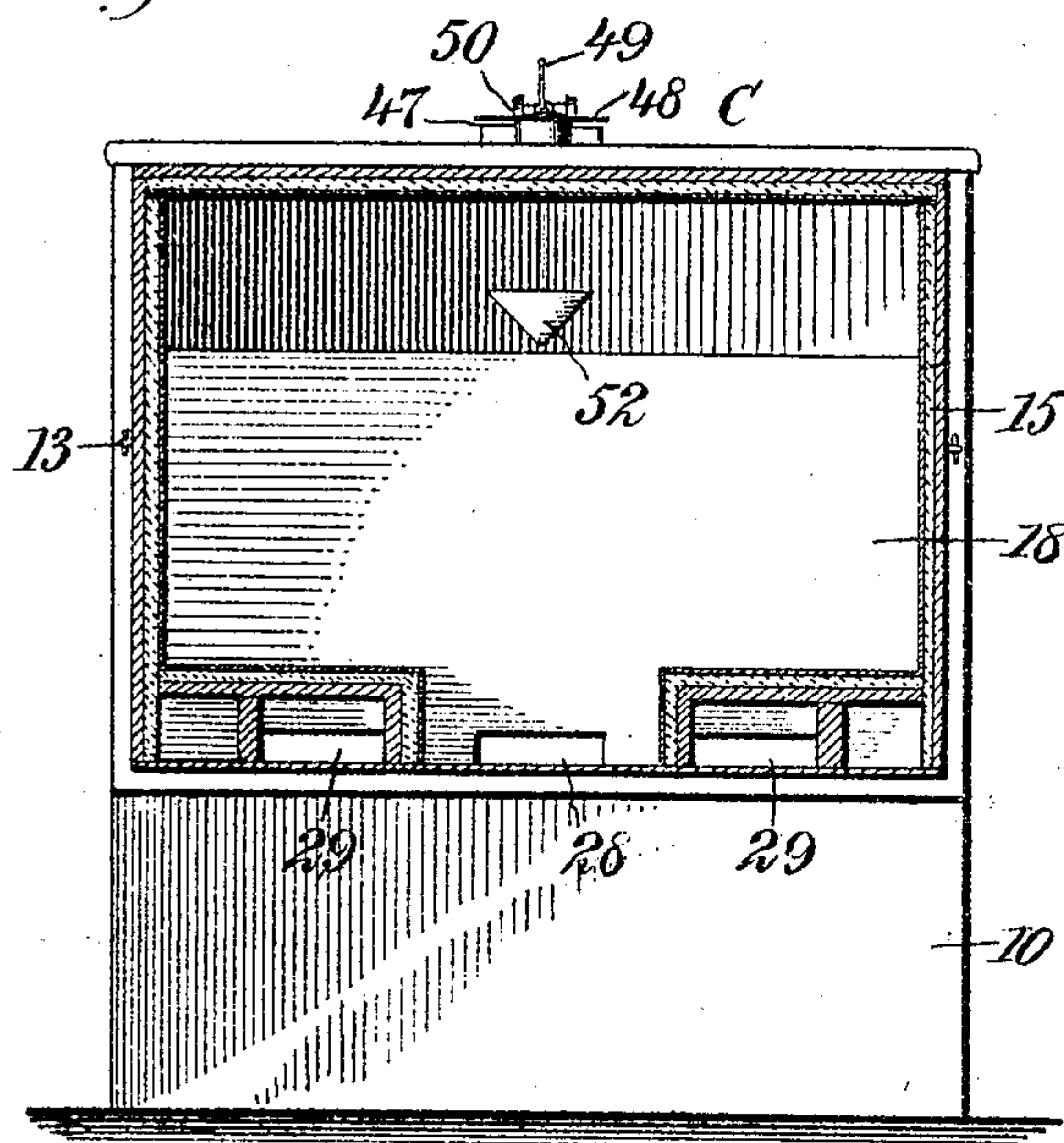


Fig. 6.



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3 SHEETS—SHEET 2.

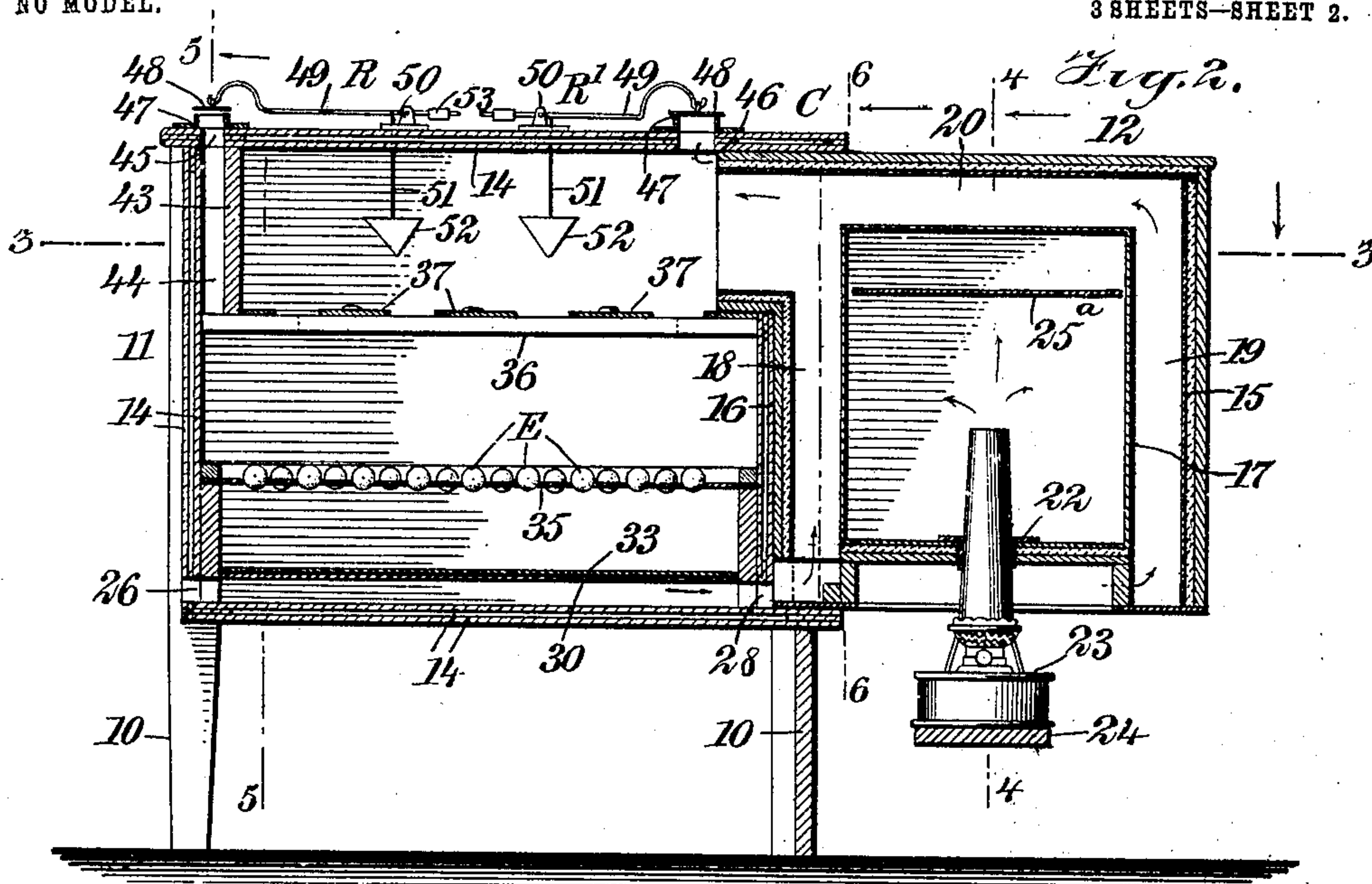
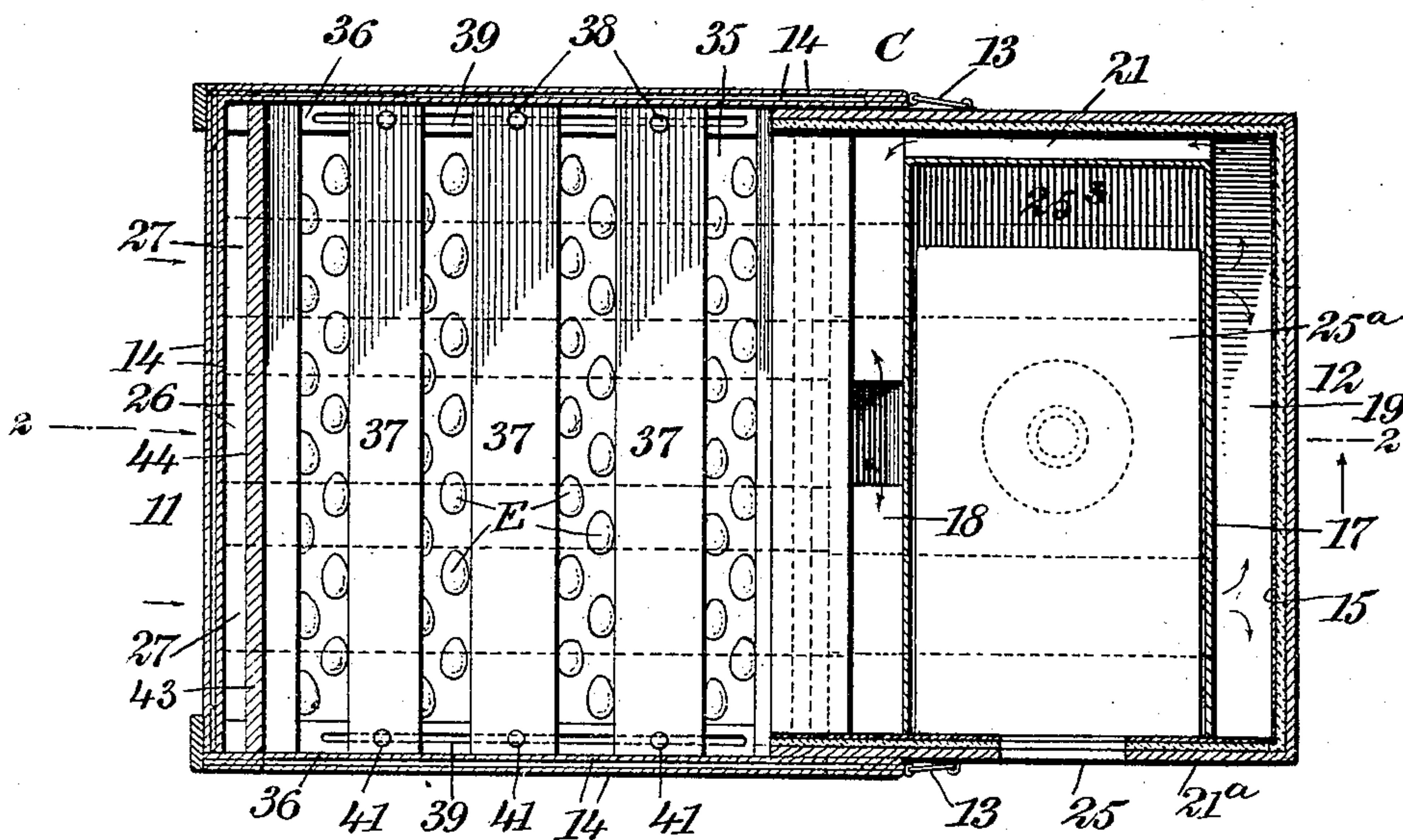


Fig. 3.



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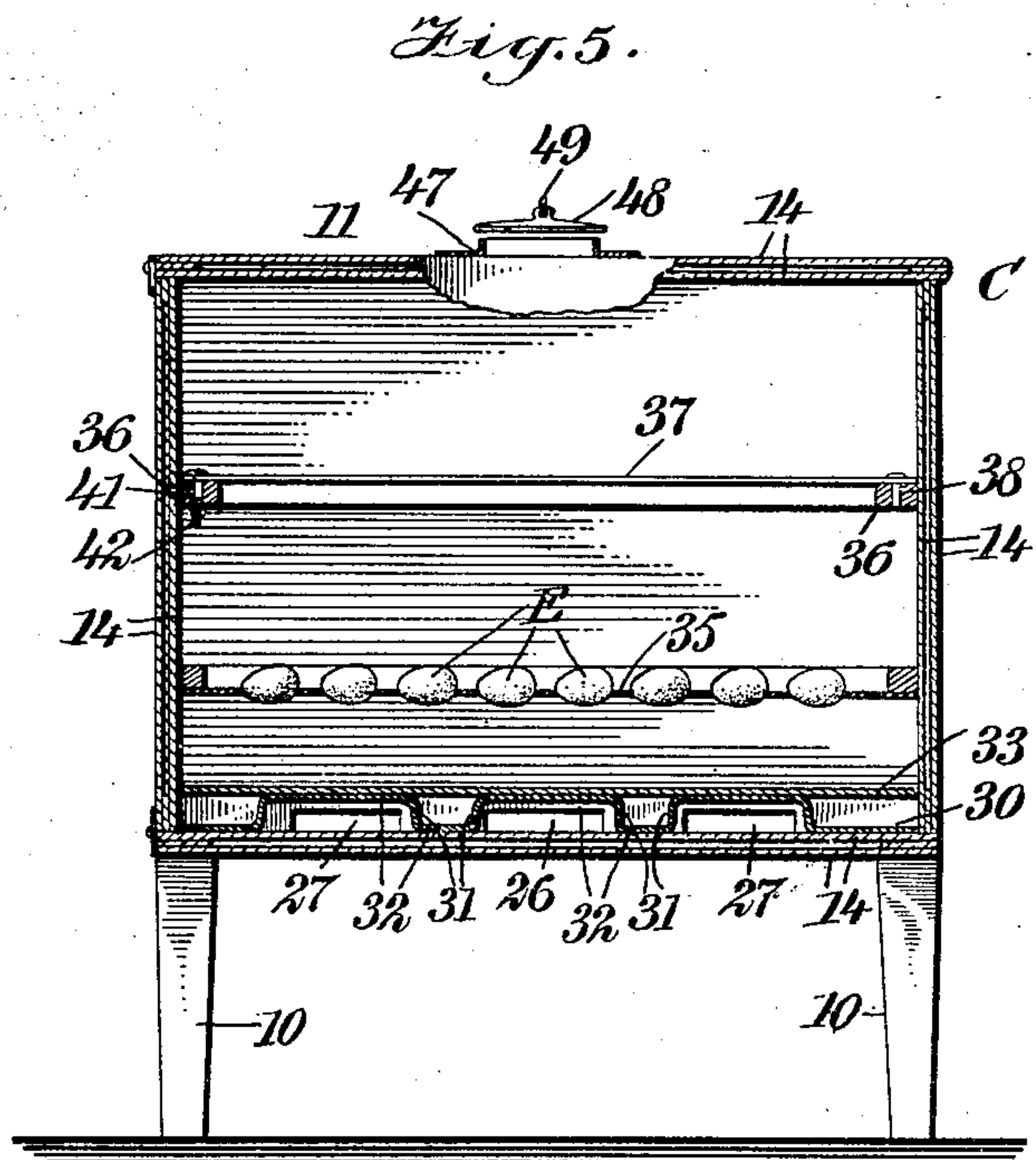
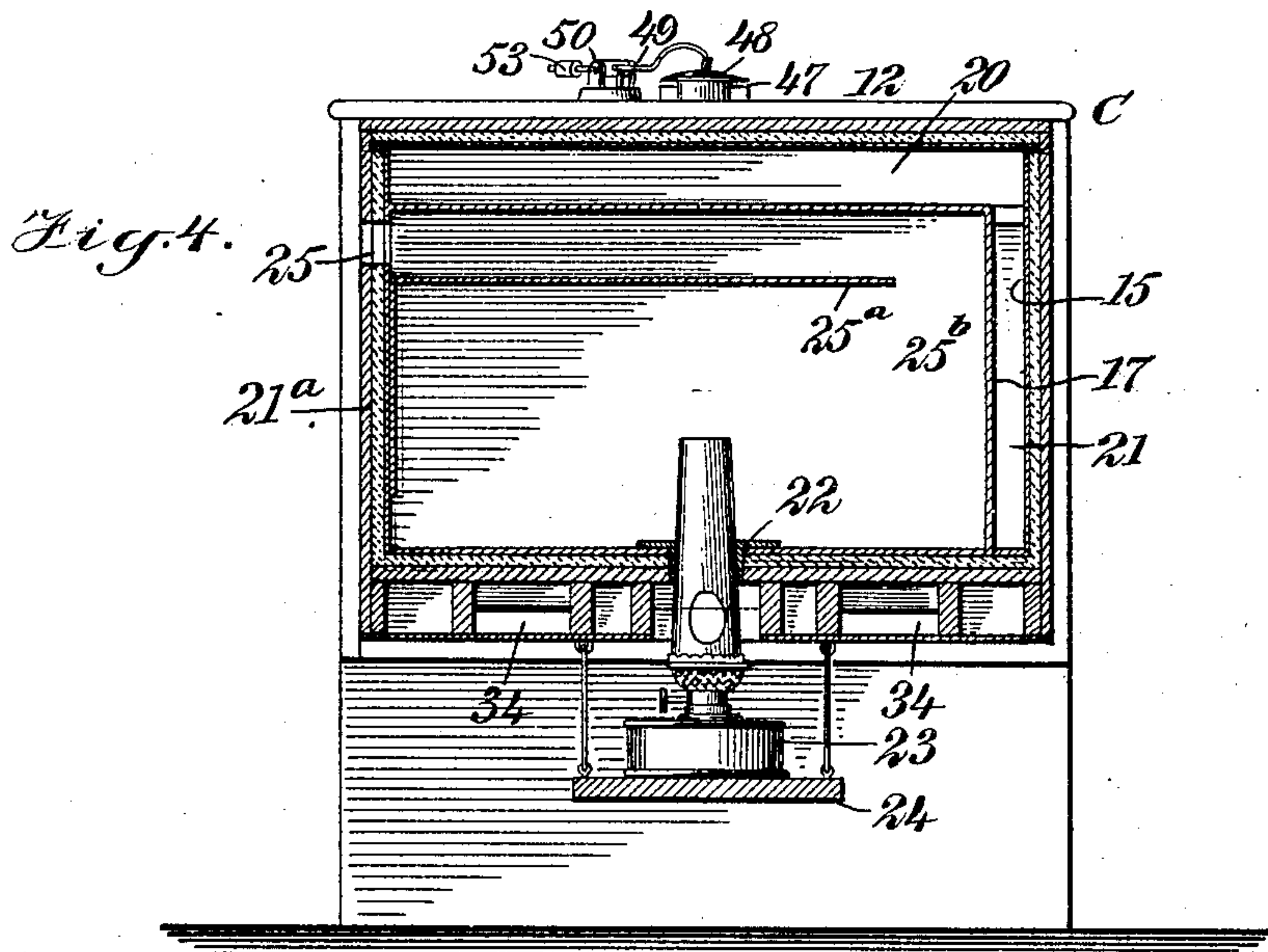
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

WILLIAM H. HUGHES, OF NEW YORK, N. Y.

INCUBATOR.

SPECIFICATION forming part of Letters Patent No. 774,076, dated November 1, 1904.

Application filed May 3, 1904. Serial No. 206,131. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. HUGHES, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Incubator, of which the following is a full, clear, and exact description.

My invention relates to incubators, and has for its principal objects the provision of an efficient apparatus of this class.

It consists in the various features and combinations hereinafter described, and more particularly claimed.

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.

Figure 1 is a perspective view of one embodiment of my invention. Fig. 2 is a longitudinal section therethrough on the line 2 2 of Fig. 3. Fig. 3 is a horizontal section on the line 3 3 of Fig. 2; and Figs. 4, 5, and 6 are vertical sections on the lines 4 4, 5 5, and 6 6, respectively, of Fig. 2.

C designates a main or outer casing, which may be constructed of wood and supported upon legs 10. As here illustrated, this consists of a primary section 11, constituting the egg-chamber or incubator proper, and an extension 12, which may contain the heating-chamber. As here shown, this extension is made separable from the other portion of the casing, being secured thereto by hooks 13. The portion 11 of the casing may be insulated in any desired way to prevent the loss of heat, as by double walls 14, while the extension 12 is preferably covered with some such heat-resisting material as asbestos, which is indicated at 15. This casing-section 12 may also, if desired, be constructed of sheet metal to render it entirely fireproof. Between the two chambers is a wall 16, reaching across the casing from the bottom part way to the top.

Within the heating-chamber is a heating-casing 17, which may be formed of sheet metal and separated from the casing-walls by inner and outer side spaces 18 and 19, respectively, a top space 20, and an end space 21,

while at the opposite side from this last-named space the heating-casing extends to the main casing, which furnishes a wall 21^a therefor. In the bottom wall of the heating-casing is a preferably central opening which may be surrounded by a protective bushing 22, and through this bushing extends a source of heat, here shown as a lamp 23, having its chimney reaching to a point at about the center of the casing and resting upon a suitable support 24, which may be suspended from the under side of the outer casing. The products of combustion from the lamp may escape through an opening 25 through the upper portion of the wall 21^a, and to prevent too direct escape of the heat therethrough a deflector 25^a is interposed between it and the lamp, extending from the wall below the opening across the heating-casing in proximity with the side walls, but separated from the end wall by a considerable space at 25^b.

At the opposite side of the main casing from the heating-casing near its lower portion are provided air-inlet openings, here shown as three in number, the central being designated as 26 and those upon each side of it as 27 and 28. Through the wall 16 are three corresponding openings 28 and 29. These openings are connected by passages lying side by side furnished by a partition 30, which may be of sheet metal bent to angular form to provide separating-walls 31 and opposite positioning-walls 32. The conduction of the heat through this metal partition may be prevented by a floor 33, preferably of wood, placed above it. The passage connecting the openings 26 and 28 delivers into the space 18, while those joining the openings 27 and 29 communicate with passages 34, formed below the heating-casing and leading to the space 19.

Supported in the egg-chamber is a suitable egg-tray 35, and above this, preferably adjacent to the top of the wall 16 and at opposite sides of the casing-section 11, are supports or cleats 36, upon which rest distributors. These distributors are shown as consisting of bars 37, of any desired number and of such width as to leave spaces between them for the circulation of the heated air. At one end each

bar is provided with a projection 38, operating through a slot 39 in the support, while through the slot in the opposite support (this being on the side with a door 40, which gives access to the chamber) projects a threaded member or bolt 41, carrying upon the under side of the support a thumb-nut 42. This arrangement permits the distributors to be slid along their supports and fixed in the desired position.

At the end of the casing farthest from the heating-chamber is a substantially vertical partition 43, furnishing with the wall of the casing an extended outlet-passage 44, which opens at 45 through the top of the casing. This partition preferably extends at least to the plane of the under side of the distributors, so that the air must pass below these latter before it can escape. In the top of the casing, here shown as in substantially the center axis thereof and at a point adjacent to the opening between the heating-chamber and egg-chamber, is a second outlet-opening 46. Both of these openings may be surrounded by flanges 47, with which coact closures or dampers 48. The dampers for the openings 45 and 46 are controlled in position by automatic regulating mechanisms R and R', respectively. Each of these may consist of a lever 49, fulcrumed to a fixture 50, secured upon the top of the casing, and from this lever depends a pivoted rod 51, extending into the upper portion of the egg-chamber and carrying a closed vessel or controlling member 52, which may contain any desired expansible fluid—for example, ether. To balance the damper and controlling member, a counterweight 53 is provided.

In use the lamp within the heating-casing is lighted, it taking its supply of air outside both this and the main casing and discharging the heated air through the opening 25. In its passage from the lamp to this opening about the deflector the heat from the lamp will be imparted to the walls of the casing 17, and they will in turn raise the temperature of the air introduced through the inlet-openings and circulating about the heating-casing through the spaces between it and the main casing, this circulating air, however, being without communication with that inside the heating-casing. The regulator R of the egg-chamber will be normally open, while the regulator R' is closed. The air will therefore pass from the top of the egg-chamber down between the distributors, which are adjusted to uniformly deflect it upon the eggs E, lying upon the egg-trays. It then rises and escapes through the outlet-opening 45. If the temperature within the egg-chamber becomes higher than is desired, the regulator R' is so adjusted that its damper will open and allow a portion of the air to escape through the opening 46 immediately upon its entrance into the chamber. If, on the other hand, the supply of heat is insuf-

ficient, the damper of the opening 45 will close and so remain until the heat has increased to the normal.

It will be noticed that the inlet for the fresh air which is to be passed through the egg-chamber is removed to the greatest possible extent from the lamp and from the outlet of the heating-casing, so that it is practically impossible for it to become contaminated by the fumes of the burning hydrocarbon, which if brought into contact with the eggs would be liable to injure them. The heating-casing itself has no communication with the egg-chamber, and therefore no danger can arise from this source. The distribution of air about this casing causes it to become economically and uniformly heated, and the distributors insure an even application of heat to the eggs. The regulator R' releases the excess of heat at a most effective point before it can impart its high temperature to the eggs, while the regulator R will retain the heat upon a fall of temperature for a long time by a complete closure of the outlet-openings. The controlling means for both these regulators are situated over substantially the center of the egg-trays, so that they are under the influence of the average conditions in the egg-chamber.

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

1. An incubator comprising a main casing containing an egg-chamber and a heating-chamber, and a heating-casing within the heating-chamber, the main casing having inlet-passages leading to the heating-chamber at opposite sides of the heating-casing.

2. An incubator comprising a main casing containing an egg-chamber and a heating-chamber, and a heating-casing within the heating-chamber, the main casing having inlet-passages extending below the egg-chamber and leading to the heating-chamber at opposite sides of the heating-casing.

3. An incubator comprising a main casing containing an egg-chamber and a heating-chamber, and a heating-casing within the heating-chamber, the main casing having three inlet-passages extending side by side below the egg-chamber, the center passage leading to the heating-chamber at the side adjacent to the egg-chamber, and the outer passages being extended below the heating-casing into the heating-chamber.

4. An incubator comprising a main casing containing an egg-chamber and a heating-chamber, and a heating-casing within the heating-chamber, the main casing having an inlet-passage leading to the heating-chamber, and the heating-casing having an outlet at one side of the main casing.

5. An incubator comprising a main casing containing an egg-chamber and a heating-chamber, a heating-casing within the heating-chamber, the main casing having an inlet-passage leading to the heating-chamber and

the heating-casing having an outlet at one side of the main casing, a source of heat entering the heating-casing, and a deflector extending between the outlet-opening and the source of heat.

6. An incubator comprising a main casing containing an egg-chamber and a heating-chamber; a heating-casing within the heating-chamber, the main casing having an inlet-passage leading to the heating-chamber and the heating-casing having an outlet at one side of the main casing, a source of heat entering the heating-casing, and a deflector extending from the wall of the heating-casing below the outlet-opening and above the source of heat and into proximity with the adjacent casing-walls.

7. An incubator comprising a casing, an egg-tray situated within the casing, means for supplying heated air to the casing, distributors arranged between the source of heated air and the egg-tray, and means for adjusting the distributors.

8. An incubator comprising a casing, an egg-tray situated within the casing, means for supplying heated air to the casing, and separated distributing-bars arranged between the source of heated air and the egg-tray, the casing having an outlet-passage leading from below the bars.

9. An incubator comprising a casing, an egg-tray situated within the casing, means for supplying heated air to the casing, and distributors arranged between the source of heated air and the egg-tray, the casing having an outlet-passage leading from below the distributors through the top of the casing.

10. An incubator comprising a casing, an egg-tray situated within the casing, means for supplying heated air to the casing, supports disposed above the egg-tray, and bars movable upon the supports.

11. An incubator comprising a casing provided with a plurality of inlet-openings and containing an egg-chamber and a heating-chamber, and an angular partition in the egg-

chamber forming separate passages connecting the inlet-openings with the heating-chamber.

12. An incubator comprising a casing containing an egg-chamber and a heating-chamber communicating therewith, the casing having an outlet-opening adjacent to the point of communication between the chambers, and an automatic regulator coacting with the opening.

13. An incubator comprising a casing containing an egg-chamber and a heating-chamber communicating therewith, the casing having an outlet-opening adjacent to the point of communication between the chambers, and a second outlet-opening at the opposite side of the egg-chamber from that first named, and an independent automatic regulator coacting with each opening.

14. An incubator comprising a casing containing an egg-chamber and a heating-chamber communicating therewith, the casing having an outlet-opening adjacent to the point of communication between the chambers and a second outlet-opening at the opposite side of the egg-chamber from that first named, an independent automatic regulator coacting with each opening, and controlling means for both regulators situated near the center of the egg-chamber.

15. An incubator comprising a casing, an egg-tray situated within the casing, means for supplying heated air to the casing, distributors arranged between the source of heated air and the egg-tray, the casing having an outlet-passage leading from below the distributors through the top of the casing, and an automatic regulator coacting with the passage.

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

WILLIAM H. HUGHES.

Witnesses:

WILLIAM FRENCH FOSTER,
H. WM. GRIMMEL.