

(No Model.)

2 Sheets—Sheet 1.

J. W. ATKINSON.
INCUBATOR.

No. 467,285.

Patented Jan. 19, 1892.

Fig. 1.

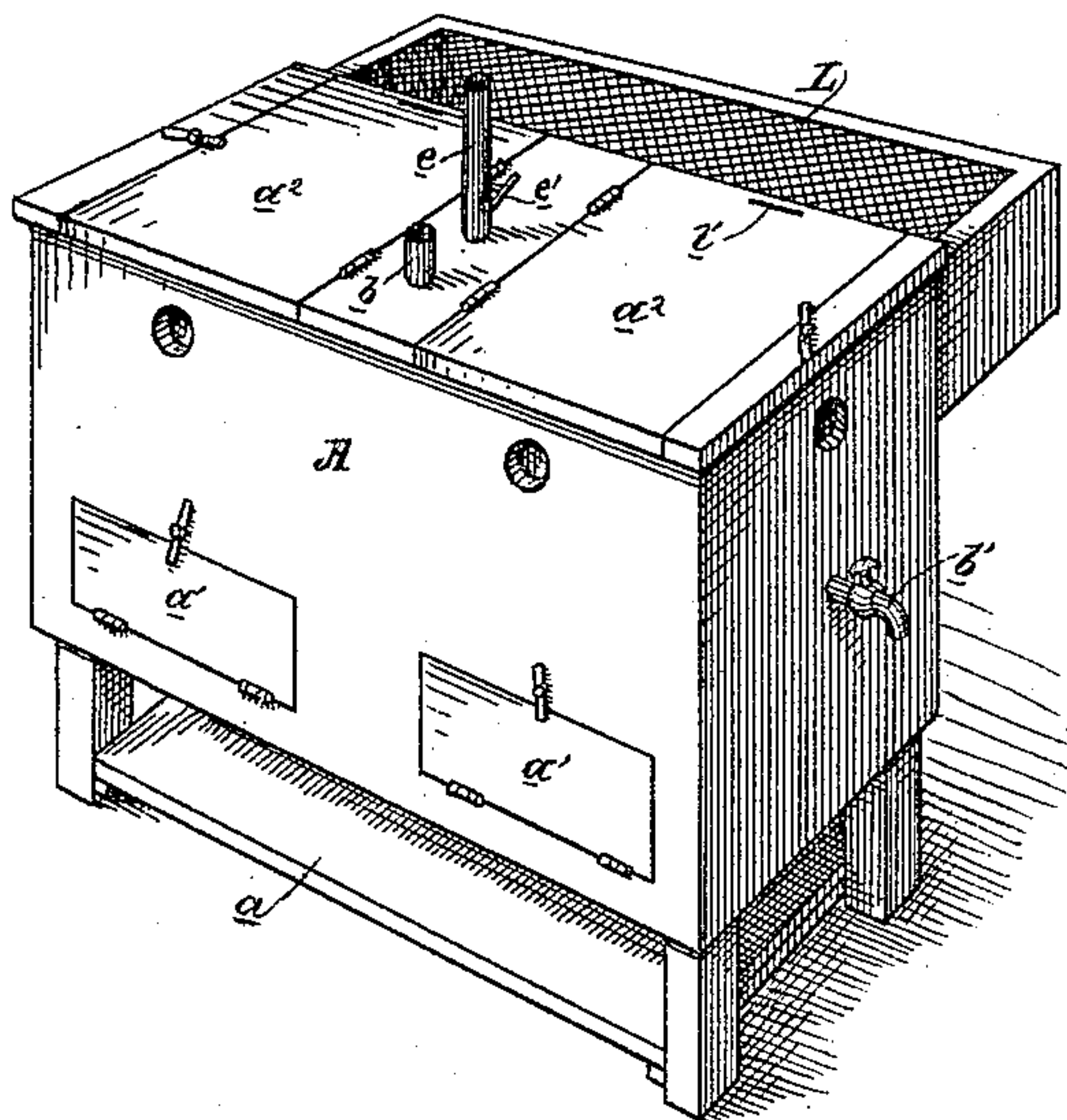
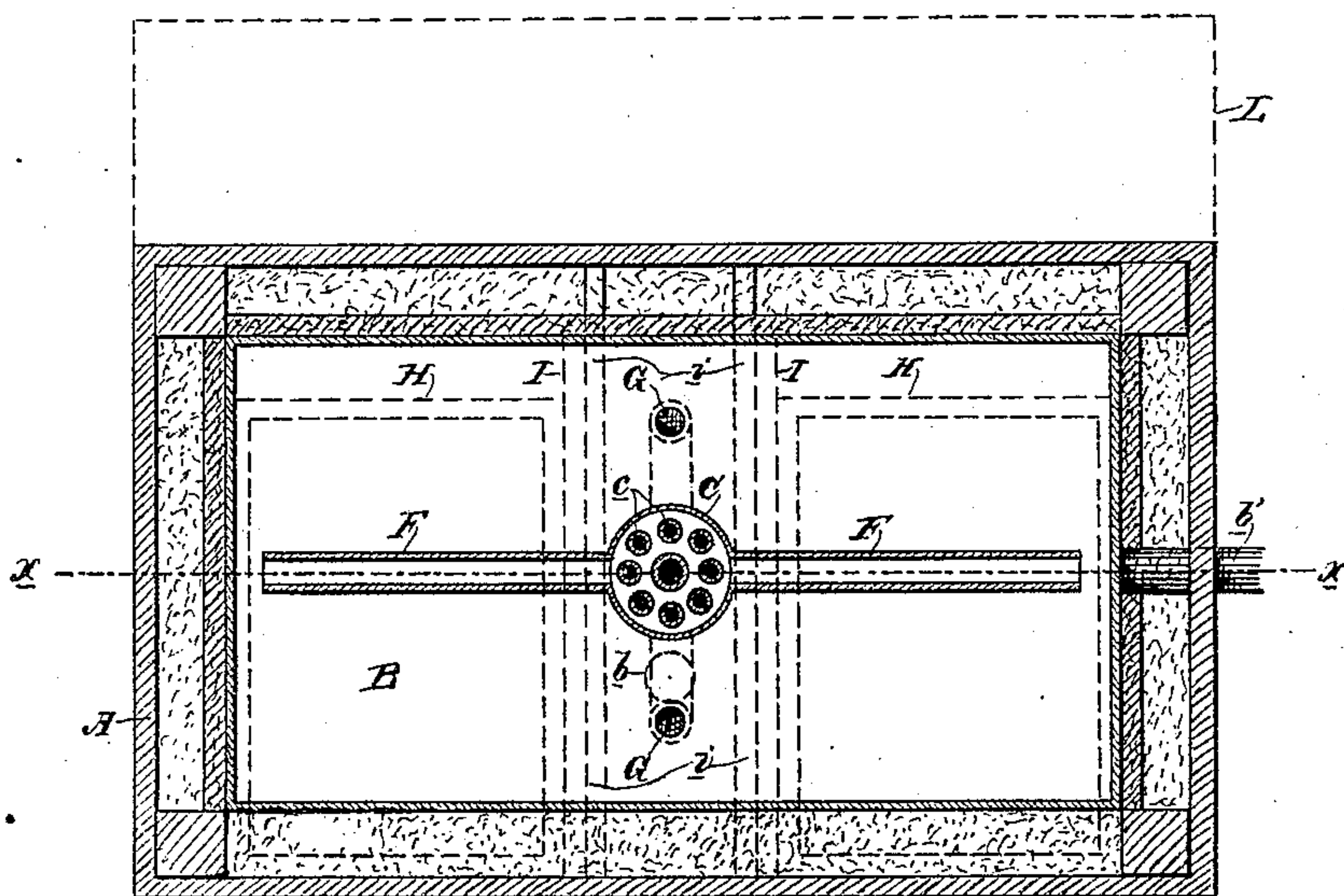


Fig. 2.

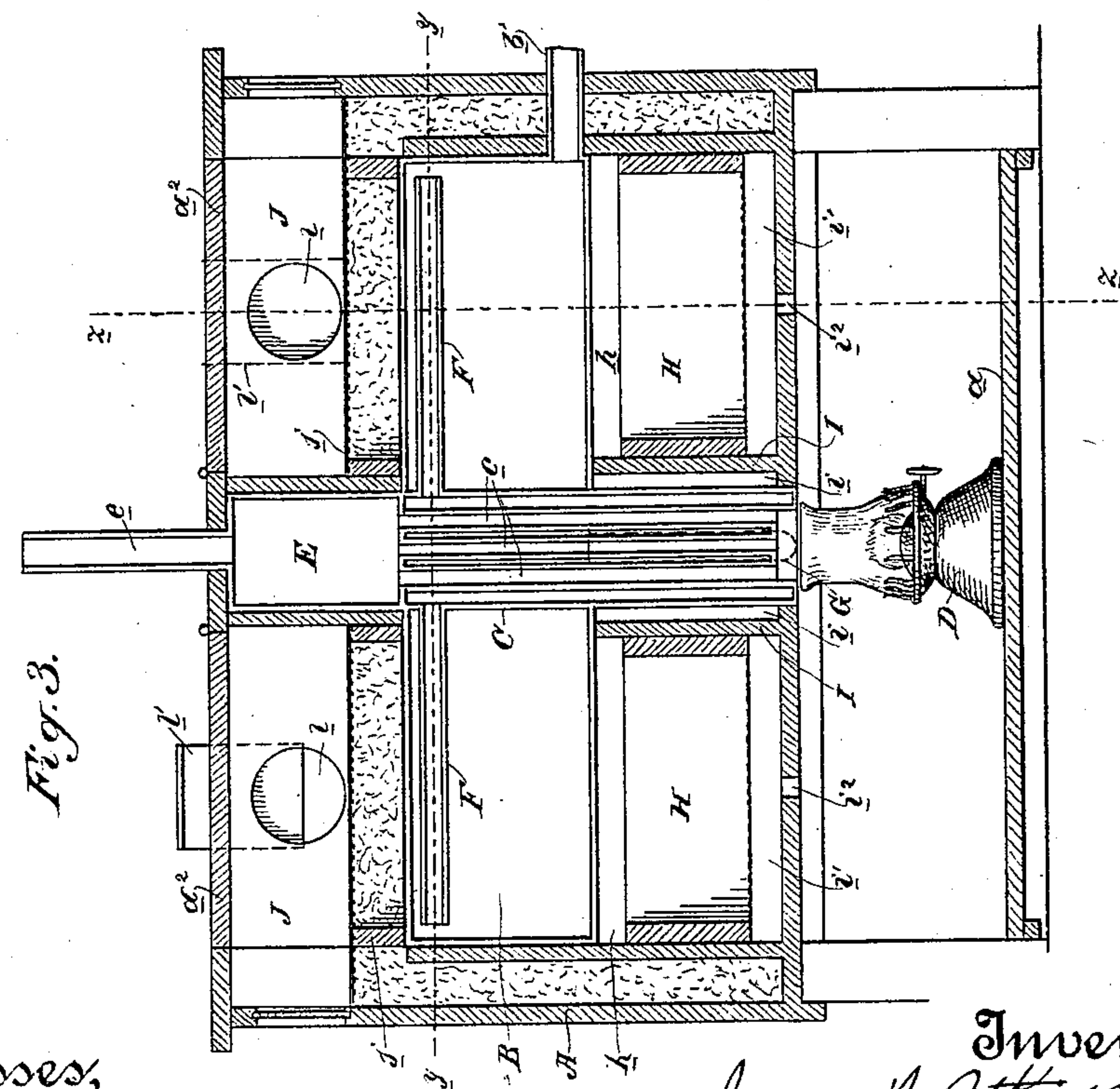


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2 Sheets—Sheet 2.

Patented Jan. 19, 1892.



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UNITED STATES PATENT OFFICE.

JAMES W. ATKINSON, OF MILPITAS, CALIFORNIA.

INCUBATOR.

SPECIFICATION forming part of Letters Patent No. 467,285, dated January 19, 1892.

Application filed June 15, 1891. Serial No. 396,368. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. ATKINSON, a citizen of the United States, residing at Milpitas, Santa Clara county, State of California, have invented an Improvement in Incubators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of incubators in which a circulation of heated water is provided for; and my invention consists of the constructions and combinations of devices which I shall hereinafter fully describe and claim.

The general object of my invention is to provide an incubator simple in construction and efficient in operation. These objects are attained by the arrangement of parts and the proper and perfect distribution of the heat due to the circulation through properly directed channels of the heating medium.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a perspective view of my incubator. Fig. 2 is a horizontal cross-section on line *y y*, Fig. 3. Fig. 3 is a longitudinal vertical section on line *x x*, Fig. 2. Fig. 4 is a lateral vertical section on line *z z*, Fig. 3.

A is the frame or box of the incubator. Within this and approximately centrally located is the metallic water-tank B, having an inlet *b* through the top and a properly-controlled outlet *b'* through the end. Extending upwardly through the center of the box from below is the heater C, consisting of a metallic casing, which passes up into the water-tank to its top. Within this heater are the vertical tubes *c*, the lower ends of which open through the bottom of the casing and are exposed to the flame of a lamp D, located upon a shelf *a* below the box A. The upper ends of these tubes open into a hot-air drum E, which extends upwardly to the top of box A and has an outlet-pipe *e* controlled by a suitable damper *e'* on top. (See Fig. 1.)

From the upper end of the heater C extend the longitudinal water-pipes F, one on each side, and which project outwardly to near the ends of the water-tank, into which they open. From each side of the water-tank, at its lower portion, open out the water-pipes G, which extend to and open into the base of the heater. It will now be seen that as the heated air and

products of combustion rise in the tubes *c* of the heater the surrounding water in said heater will be raised in temperature rapidly and a circulation of water will take place through the heater, outwardly through pipes F into the tank, and thence downwardly from the tank through pipes G into the lower portion of the heater, and so around the course again. The air-drum E above the heating-tubes better controls the draft and provides for proper ventilation and a more efficient control of the heat.

Within box A are formed the spaces *h* for the egg drawers or trays H. These are located in each end of the box directly under the bottom of the water-tank, the heat of which is therefore directed downwardly on top of the eggs. The drawer-spaces *h* are separated from each other by partitions I on each side of the heater, and between the partitions and around the heater is an air-space *i*, and another air-space *i'* is below the bottom of each egg-drawer, said bottom air-space communicating with the outer air by holes *i''* in the bottom of the box. The drawers have bottoms made of wire-cloth and are confined in their seats and are reached by means of doors *a'* in the front of the box.

Directly above the water-tank in each end of the box are chambers J for the reception of the newly-hatched chicks. In these chambers are wire-cloth-covered frames *j*, which may be covered with a strip of burlap for the sake of cleanliness, and a similar strip may be placed in the bottom of each drawer. The chambers J are reached by means of doors *a''* in the top of box A. The vertical spaces just within the sides and ends of the box and between them and the side and end walls of the egg-drawer spaces and water-tank are packed with sawdust, and sawdust is also placed in the central space about the air-drum and upon the top of the tank just under the bottoms of the frames *j*.

Non-conducting material other than sawdust may be used, and the surface of the tank may be covered, if desirable, with builders' paper.

L is a brooding-chamber consisting of a box preferably covered with wire-cloth. It is hinged to the side of the box A and is supported therefrom by suitable braces. It has

apertures *l*, which communicate with the reception-chambers *J*, said apertures being controlled by gates *l'*. When the chicks are first hatched, they are put in chambers *J* and receive sufficient warmth from the underlying tank. When strong enough, they run through apertures *l* into the chamber *L*, and from this chamber a suitable ladder may be extended to allow them subsequently to pass down into a properly-inclosed yard.

It will be seen that by the construction of my incubator the heat is applied to the tops of the eggs, which is as it should be, and the air-spaces under the eggs provide for what I have found to be necessary for the best results—namely, a slightly lower temperature under the egg than that above it. The heat can be kept constant, the ventilation is good, and the machine is simple, compact, can be cleaned with facility, and the progress of the operation watched and kept under control.

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

1. In an incubator, the combination of an exterior casing having a water-tank supported within it, a heater located within the central portion of the casing, passing through the wa-

ter-tank, and having horizontal pipes extending from its upper ends and communicating with the contents of the tank, the pipes *G* within the casing, leading downward from the lower portion of the tank to the base of the heater, and a heater within the lower portion of the casing contiguous to the lower end of the heater, substantially as herein described.

2. In an incubator, the combination of an exterior frame having a water-tank within it, a heater centrally disposed between the walls of the casing and passing through the tank, a series of hot-air tubes inclosed by the heater, communicating at one end with a heating medium and at the other end with a hot-air drum, horizontal pipes at the upper end of the heater, communicating therewith and with the water-tank, and pipes *G*, leading from the bottom of the tank to the lower end of the heater, whereby a circulation of water is effected, substantially as herein described.

In witness whereof I have hereunto set my hand.

JAMES W. ATKINSON.

Witnesses:

WM. F. BOOTH,
S. H. NOURSE.