

No. 714,653.

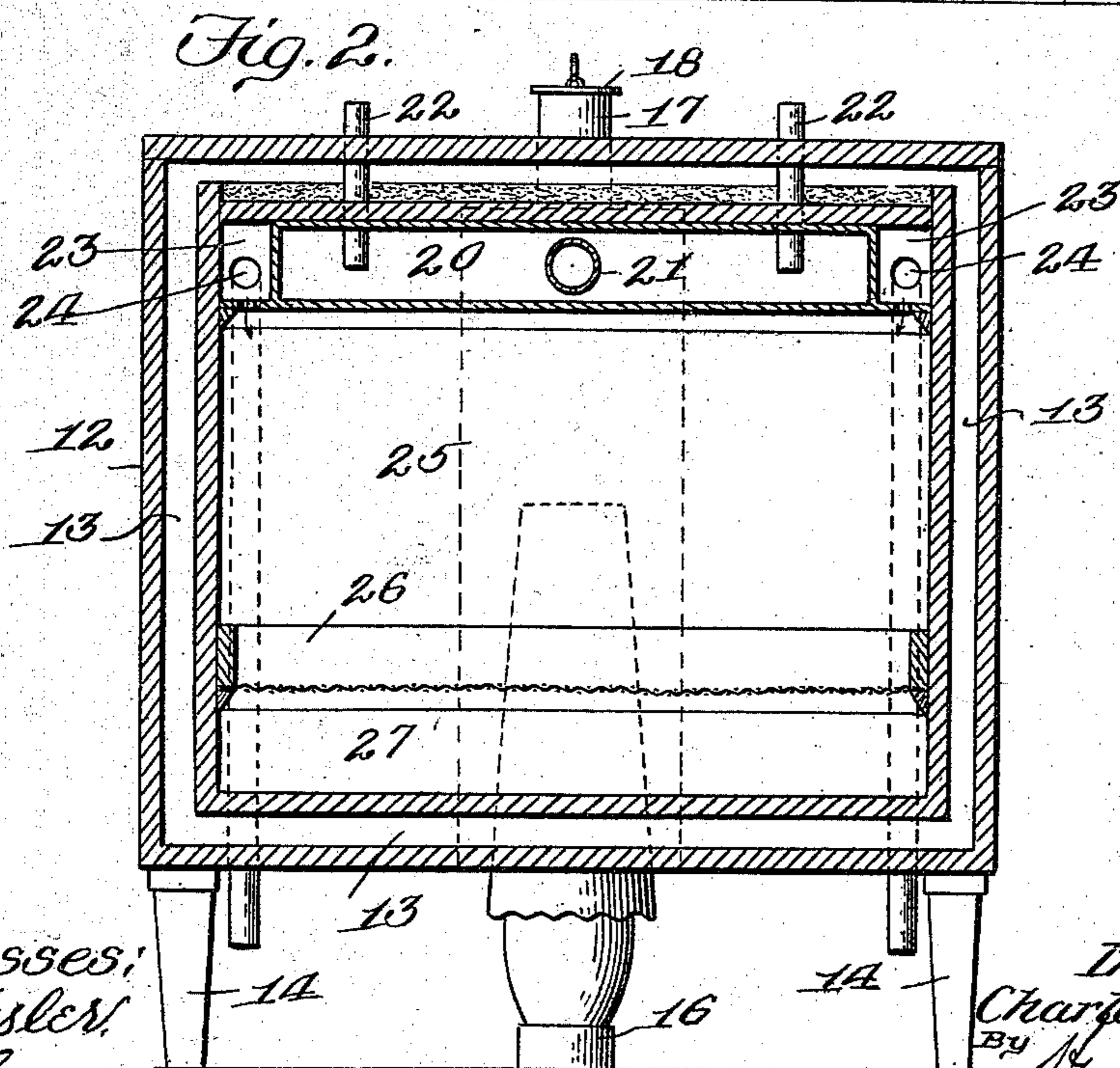
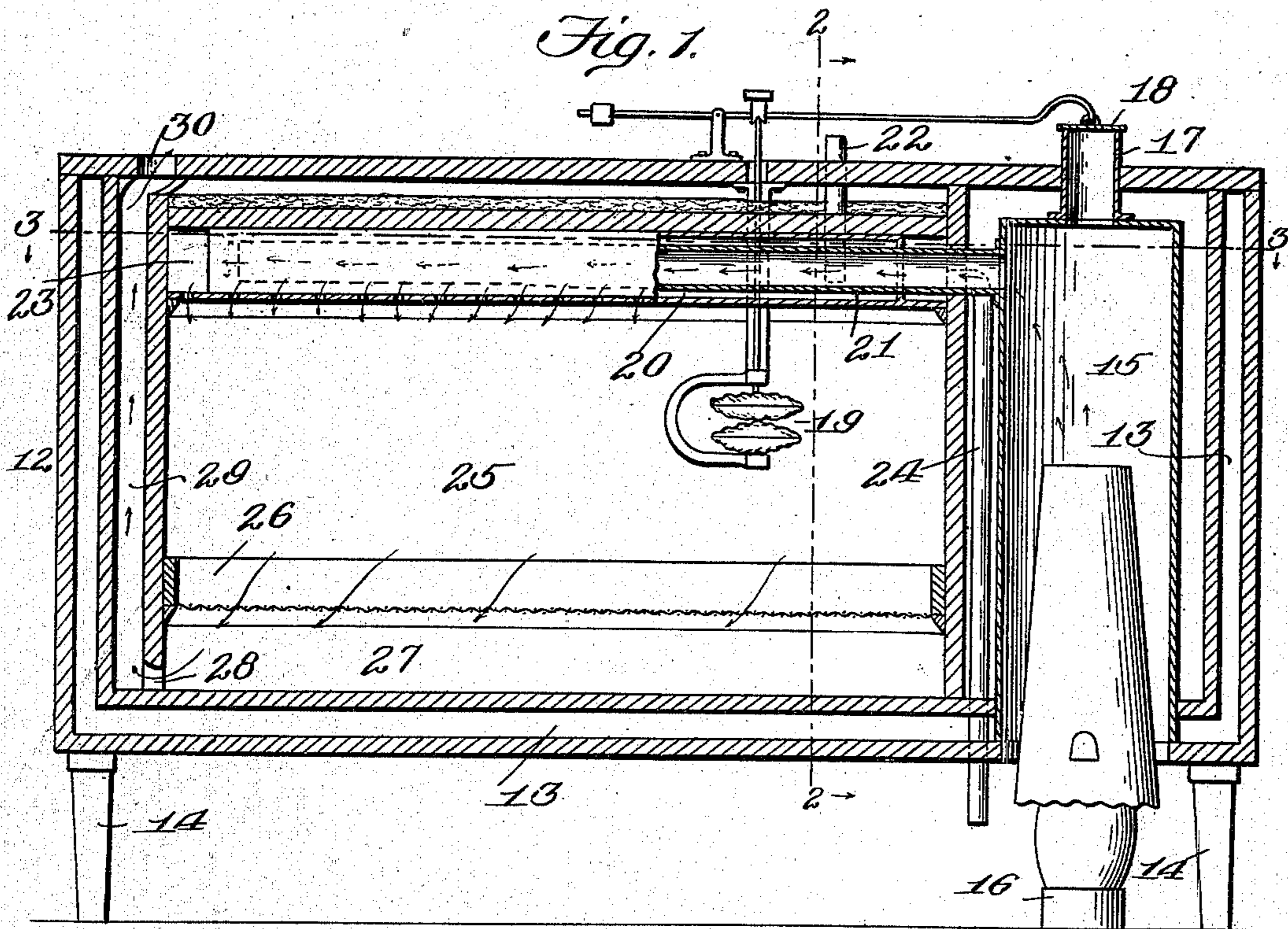
Patented Dec. 2, 1902.

C. E. ADAIR.  
INCUBATOR.

(Application filed June 9, 1902.)

(No Model.)

2 Sheets—Sheet 1.



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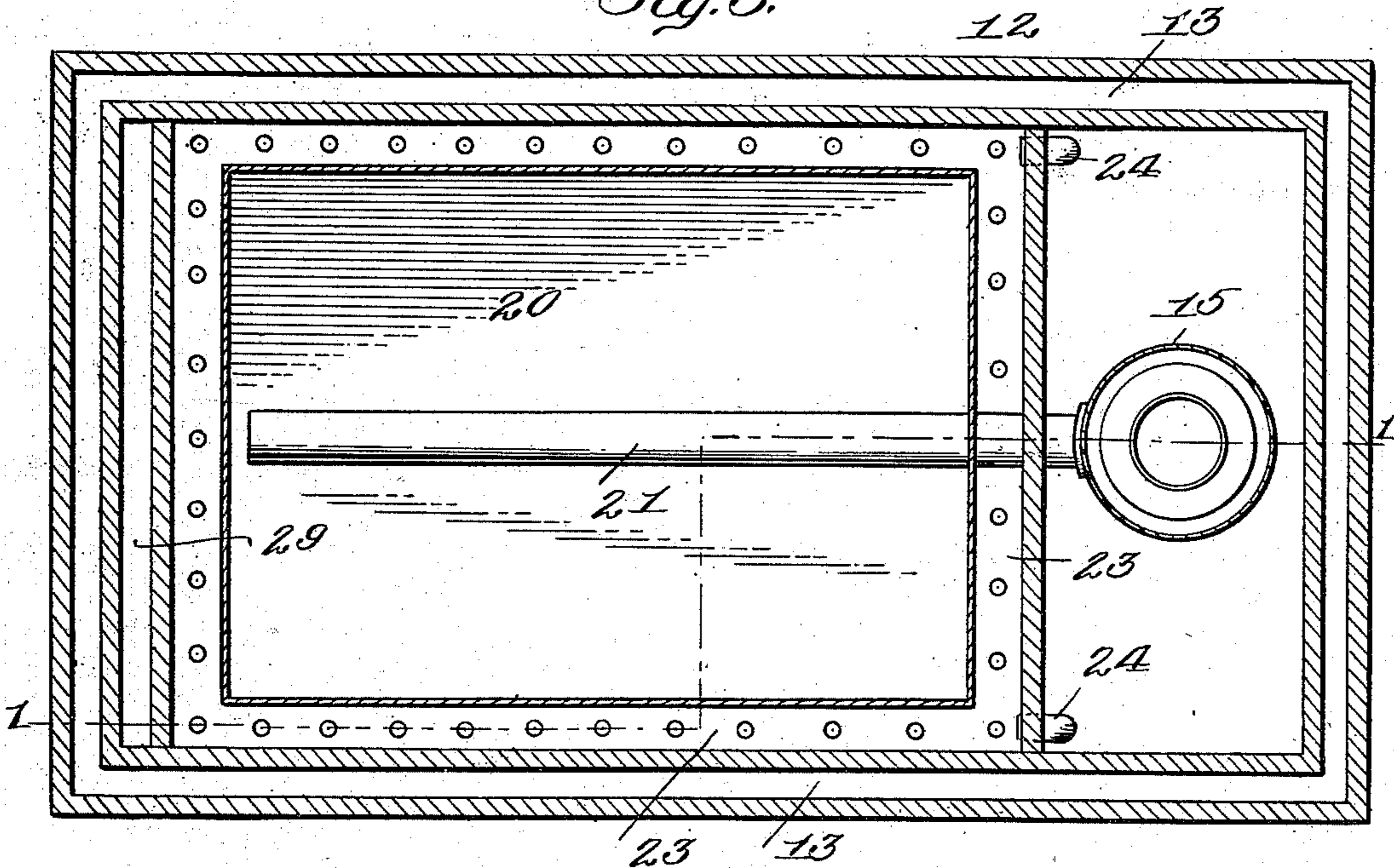
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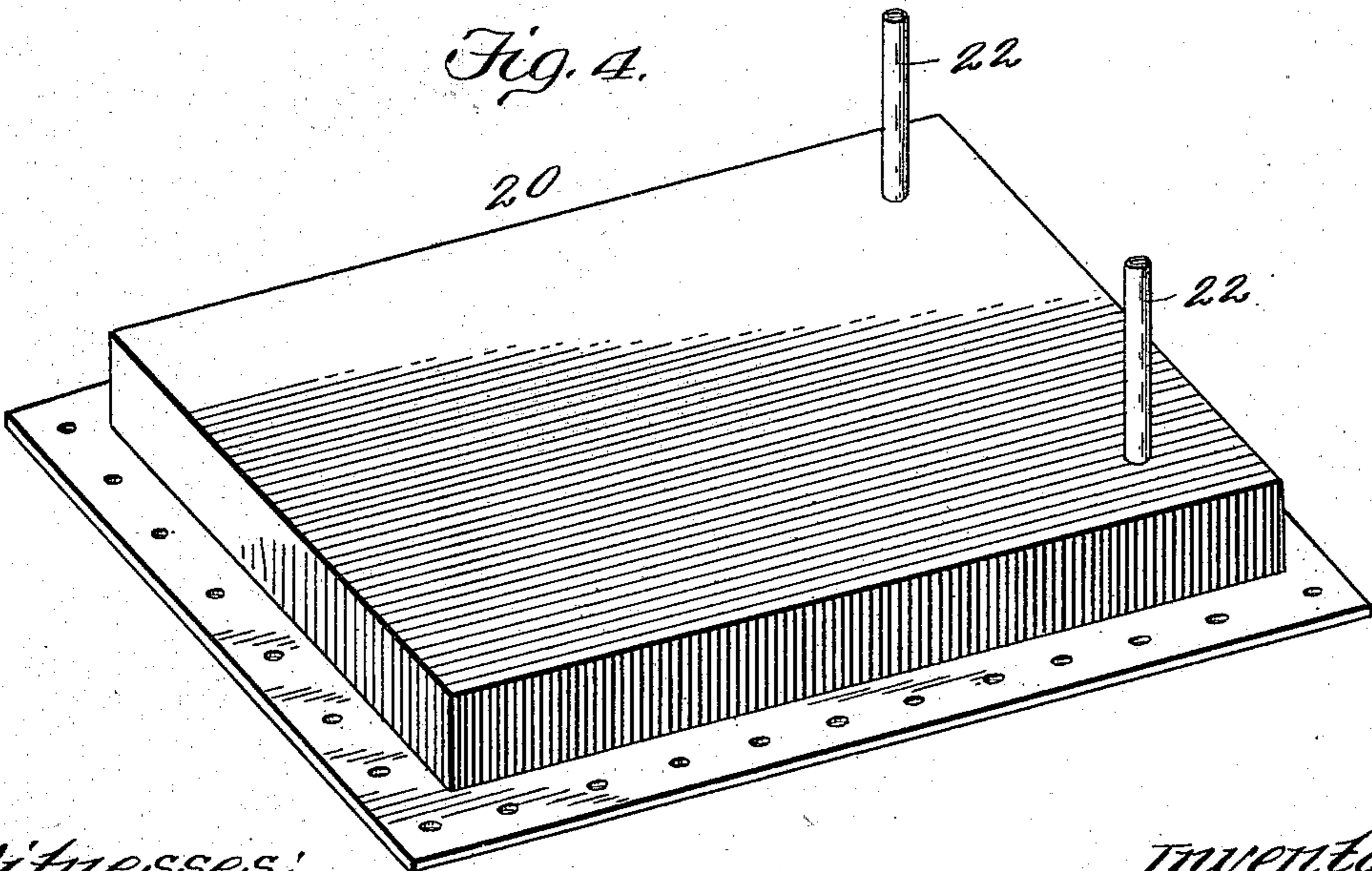
(No Model.)

2 Sheets—Sheet 2.

*Fig. 3.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

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## INCUBATOR.

SPECIFICATION forming part of Letters Patent No. 714,653, dated December 2, 1902.

Application filed June 9, 1902. Serial No. 110,922. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. ADAIR, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Incubators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has for its object to provide an incubator of such construction that the heat will be evenly distributed therein, so that all portions of the egg-chamber will be of uniform temperature as nearly as possible, as also to provide means whereby a proper supply of warm fresh air may be evenly introduced into the egg-chamber, so that all parts thereof will be properly ventilated at all times.

In the accompanying drawings, Figure 1 is a vertical sectional view on line 1 1, Fig. 3, of my improved incubator. Fig. 2 is a cross-section of the same on line 2 2, Fig. 1. Fig. 3 is a horizontal section on line 3 3, Fig. 1, looking down. Fig. 4 is a detail perspective view of the radiator, showing also the bottom wall of the fresh-air chamber surrounding the same.

Referring to the drawings, 12 denotes the casing of the incubator, preferably having double walls, as usual, to form a dead-air space 13 between them, the casing of the incubator being preferably supported on legs 14. The apparatus is provided at one end with a heating-chamber 15, which is to be warmed by any suitable device, as by a lamp 16, the escape-flue 17 of the said heating-chamber being preferably governed by a damper 18, controlled by any suitable thermostatic regulating device, as 19.

In the upper portion of the incubator is located a secondary heating-chamber 20, in which is a pipe 21, communicating with the primary heating-chamber 15, said pipe 21 extending nearly the entire length of the said secondary heating-chamber, so as to discharge the hot air and products of combustion into the end of the said heating-chamber farthest from the primary heating-chamber. The secondary heating-chamber is provided near its end farthest from that into which the hot-air

pipe 21 discharges with outlet-flues 22, so that the hot air and products of combustion from the primary heating-chamber 15 will enter the secondary heating-chamber 20 through the said pipe 21 and after circulating through said chamber will be discharged therefrom through the flues 22.

Surrounding the secondary heating-chamber 20, which serves as a radiator, is a fresh-air chamber 23, into which fresh-air-inlet pipes 24 discharge. The said fresh-air-inlet pipes 24 are arranged contiguous to the primary heating-chamber 15, so that they will be warmed by conduction and radiation, and will therefore warm the fresh air entering therein, and thus induce an upward current of fresh air through the said pipes into the said fresh-air chamber 23. The bottom wall of the fresh-air chamber 23, it will be noticed, is formed by horizontal extensions of the bottom wall of the hot-air chamber or drum 20, these extensions resting upon suitable ledges on the wall of the incubator-chamber, so that when the hot-air chamber 20 is in position the said horizontal extensions form with the inner walls of the incubator a continuous fresh-air chamber or jacket surrounding and heated by the hot-air chamber 20. The said horizontal extensions are provided throughout with numerous small openings or perforations communicating with the egg-chamber 25 below and in which egg-chamber will be located the egg tray or trays 26, having perforated or foraminous bottoms of wire or any other suitable open-work to permit a free circulation of air downward through the said egg-chamber into the foul-air chamber 27 underneath. The foul-air chamber 27 communicates by an opening or openings with a discharge-chamber 29, provided at its top with a suitable opening or openings for the escape of foul air from the incubator.

From the foregoing it will be observed that the fresh-air chamber 23, surrounding the secondary heating-chamber or radiator 20, affords a jacket encompassing the said secondary heating-chamber or radiator, so that fresh air entering the said chamber 23 may be evenly warmed by radiation from the said secondary heating-chamber, while the nu-

merous distributed or separated perforations or outlets from the bottom of the said air-jacket or fresh-air chamber and which communicate with the egg-chamber below will  
 5 provide for an even distribution of warm fresh air from the said fresh-air chamber to the said air-chamber such as will insure an even temperature throughout the egg-chamber as well as an even and thorough ventilation of the same. By locating the fresh-air  
 10 chamber 23 contiguous to the edges only of the hot-air chamber 20 the said hot-air chamber and the egg-chamber 25 beneath it are adjacent, with nothing intervening except the  
 15 bottom wall of the said hot-air chamber. The result of this arrangement is that the radiation of heat from the hot-air chamber 20 is directly into the egg-chamber 25 and the temperature of the egg-chamber can be more  
 20 equably maintained than is the case where the fresh-air chamber with its inflowing currents of cool air is interposed between the hot-air chamber and the egg-chamber, as in some constructions with which I am familiar.  
 25 My invention is not to be understood as being limited to the details of construction herein shown, as these may be varied widely within the limits of mechanical skill without departing from the essential feature of the invention, which provides a fresh-air chamber  
 30 surrounding the radiator or heating-chamber of the incubator and which fresh-air chamber communicates throughout its length with the air-chamber of the incubator by means of  
 35 numerous distributed perforations or openings with which the bottom wall of the said fresh-air chamber is provided.

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

1. In an incubator, the combination with an egg-chamber having a foul-air exit, of a hot-air chamber directly over and adjacent  
 45 said egg-chamber so as to radiate heat directly thereinto, supply and exit pipes for said hot-air chamber, a continuous fresh-air chamber contiguous to the edges only of said hot-air chamber so as to form an edge-surrounding jacket therefor, said fresh-air chamber  
 50 having its bottom wall perforated at intervals with numerous distributing apertures opening into the said egg-chamber and distributing fresh, warmed air evenly through-

out the same, and fresh-air inlets for said continuous fresh-air chamber. 55

2. In an incubator; the combination with an egg-chamber; of a hot-air chamber above said egg-chamber, the bottom wall of said hot-air chamber being extended horizontally beyond the vertical side walls thereof so as to  
 60 form, with the incubator-walls, a continuous air chamber or jacket surrounding and heated by said hot-air chamber; the said bottom-wall extensions having numerous distributed perforations delivering into the egg-chamber; 65 hot-air supply and exit pipes for said hot-air chamber, and fresh-air supply pipes for said continuous air-chamber.

3. A heating chamber or drum for incubators having its bottom wall extended beyond  
 70 its vertical side walls, said bottom-wall extensions being provided at intervals with perforations.

4. In an incubator, the combination with an egg-chamber having a foul-air exit, of a  
 75 primary heating-chamber located at one end of the incubator, a secondary heating-chamber or radiator located in the upper portion of the incubator and communicating with the said primary heating-chamber by a pipe which  
 80 discharges into the said secondary heating-chamber at or near the end thereof farthest removed from said primary heating-chamber, said secondary heating-chamber being directly over and adjacent said egg-chamber so  
 85 as to radiate heat directly thereinto, discharge-flues from said secondary heating-chamber to the open air, a continuous fresh-air chamber contiguous to the edges only of said secondary heating-chamber and forming  
 90 an edge-inclosing jacket therefor, said fresh-air chamber having its bottom wall provided with perforations or openings forming numerous distributed points of communication with  
 95 said egg-chamber whereby the fresh warmed air is distributed evenly throughout said egg-chamber, and vertical fresh-air pipes opening at their tops into said fresh-air chamber and disposed adjacent the said primary heating-chamber, so as to be heated therefrom. 100

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES E. ADAIR.

Witnesses:

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