

J. A. BRITTON.

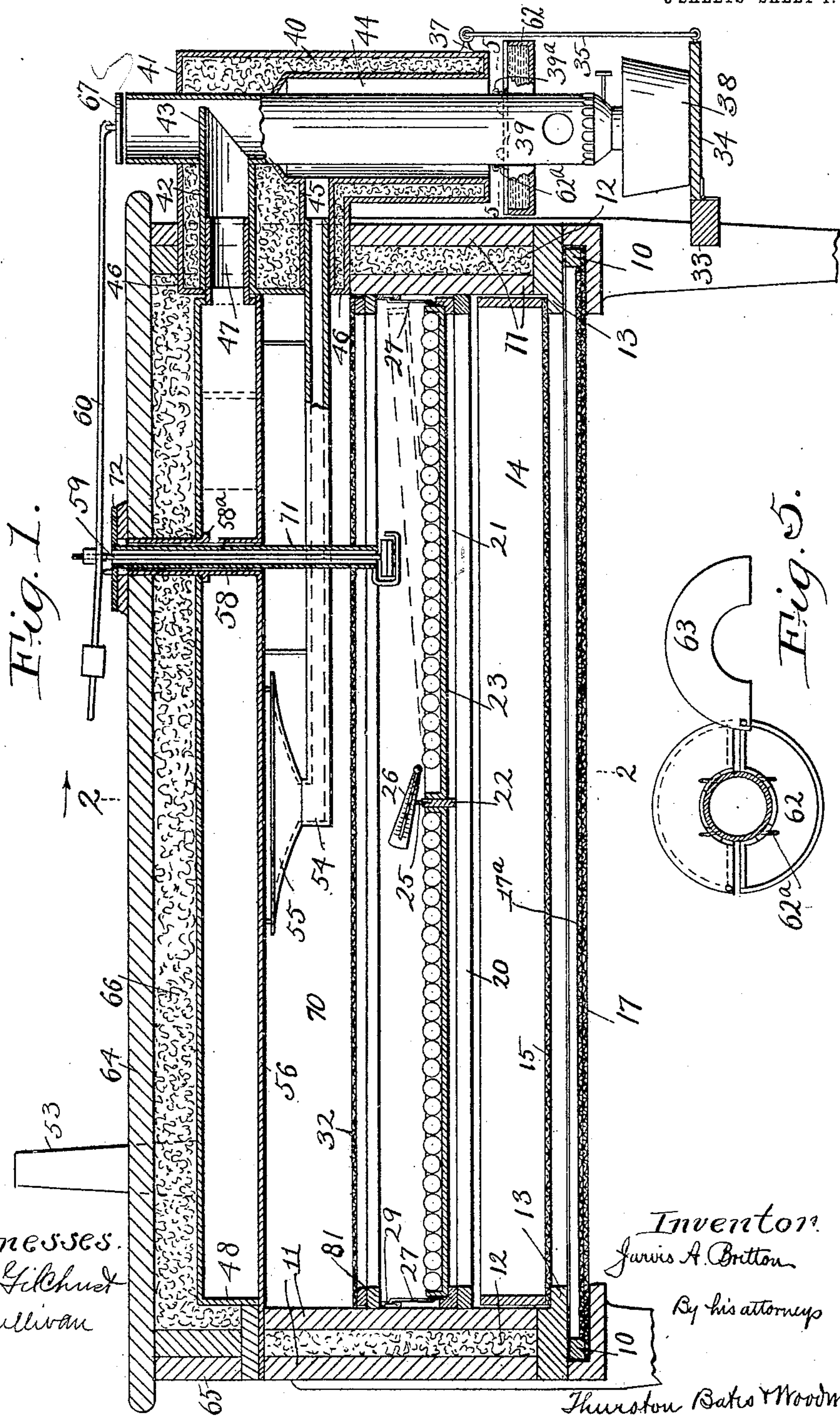
INCUBATOR.

APPLICATION FILED OCT. 21, 1905.

904,599.

Patented Nov. 24, 1908.

3 SHEETS—SHEET 1.



Witnesses.
E. B. Gilchrist
H. Sullivan

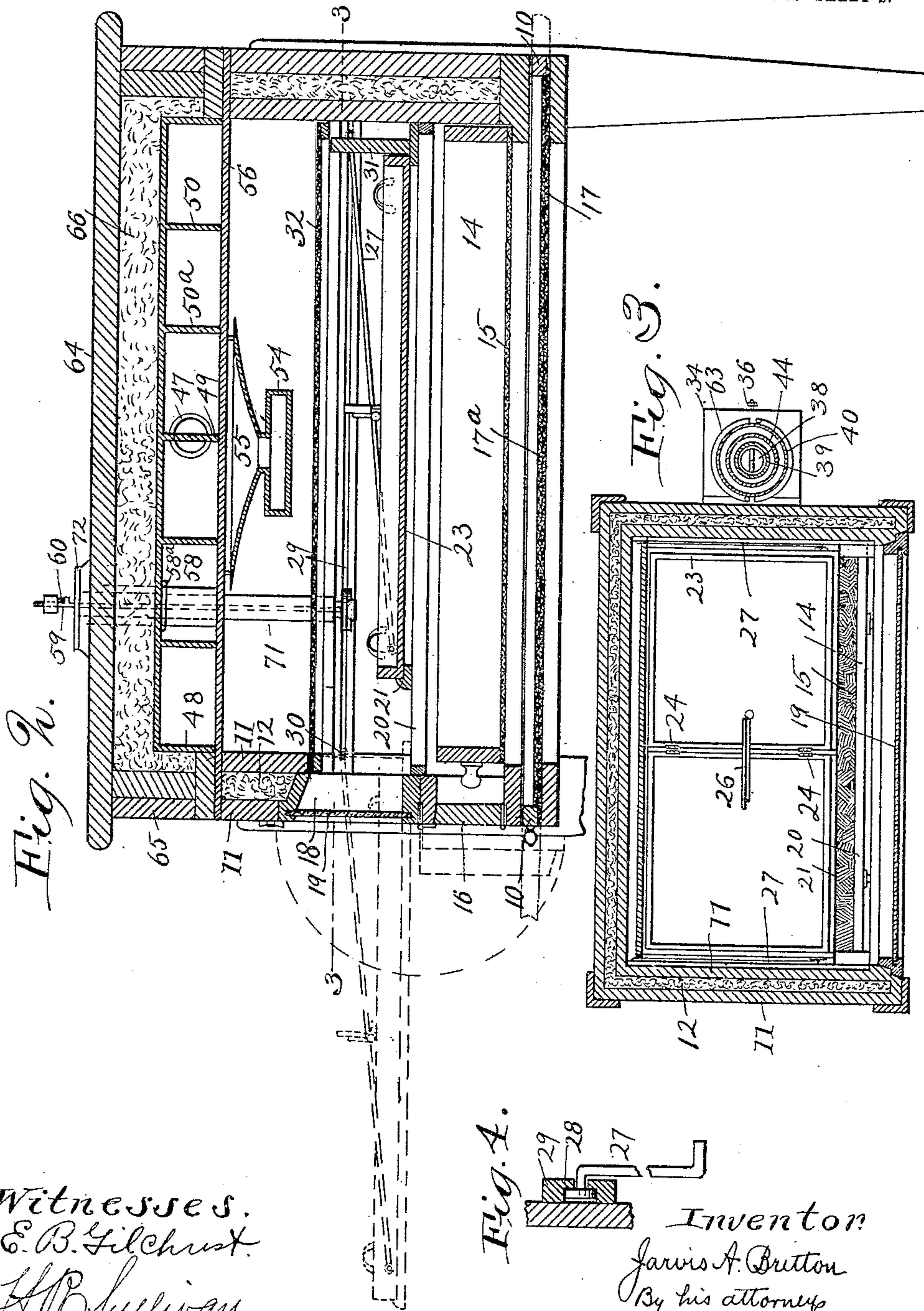
Inventor.
J. A. Britton
By his attorneys

Thurston Bates & Woodward

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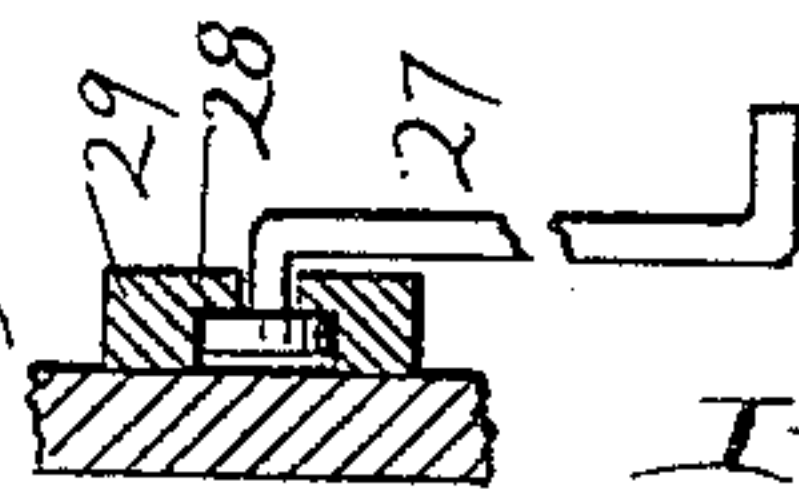
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3 SHEETS—SHEET 2.



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E. B. Gilchrist.
H. B. Sullivan

Fig. 4.



Inventor:
Jarvis A. Britton
By his attorney
Thurston Bates & Mordward

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3 SHEETS—SHEET 3.

Fig. 6.

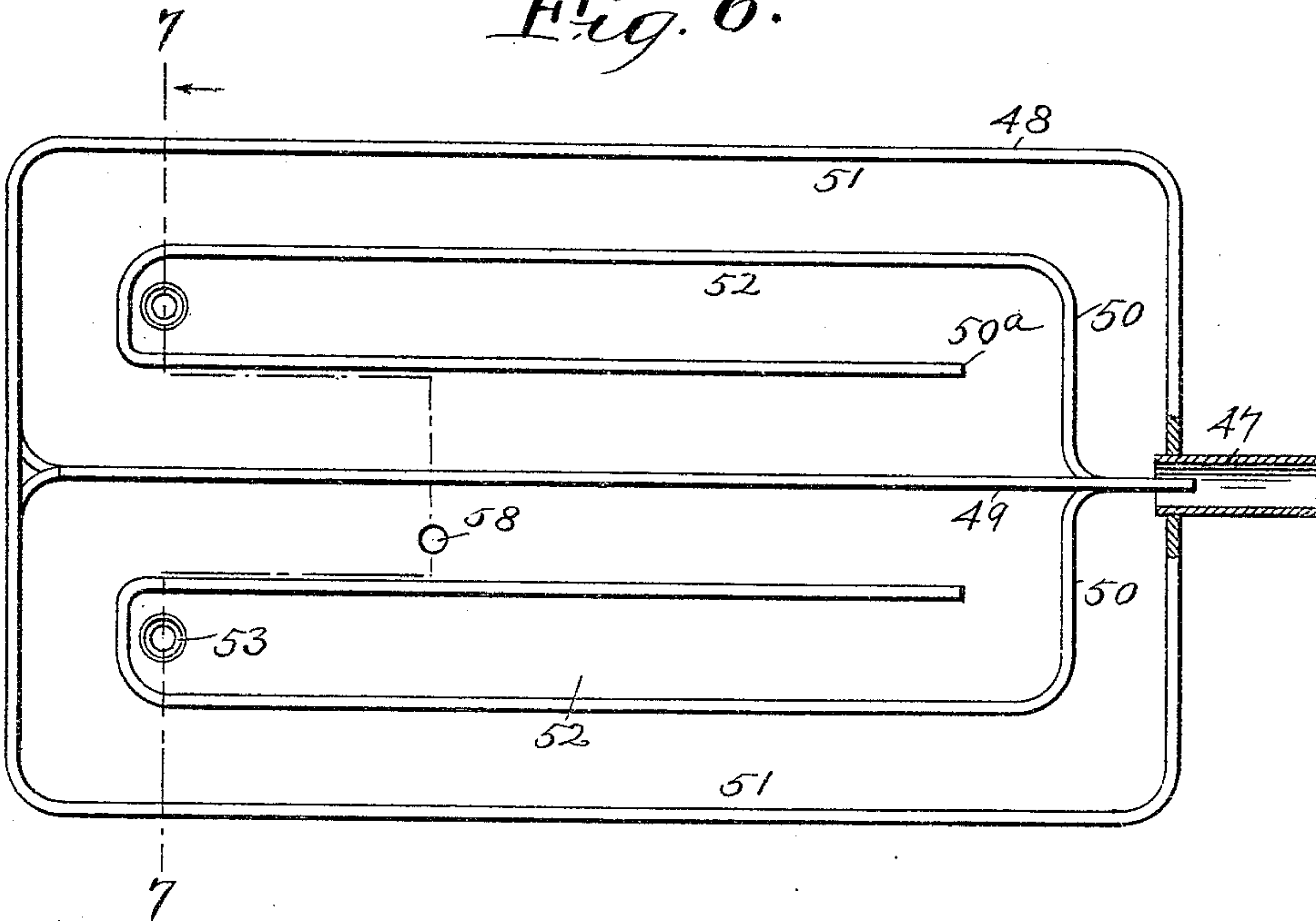
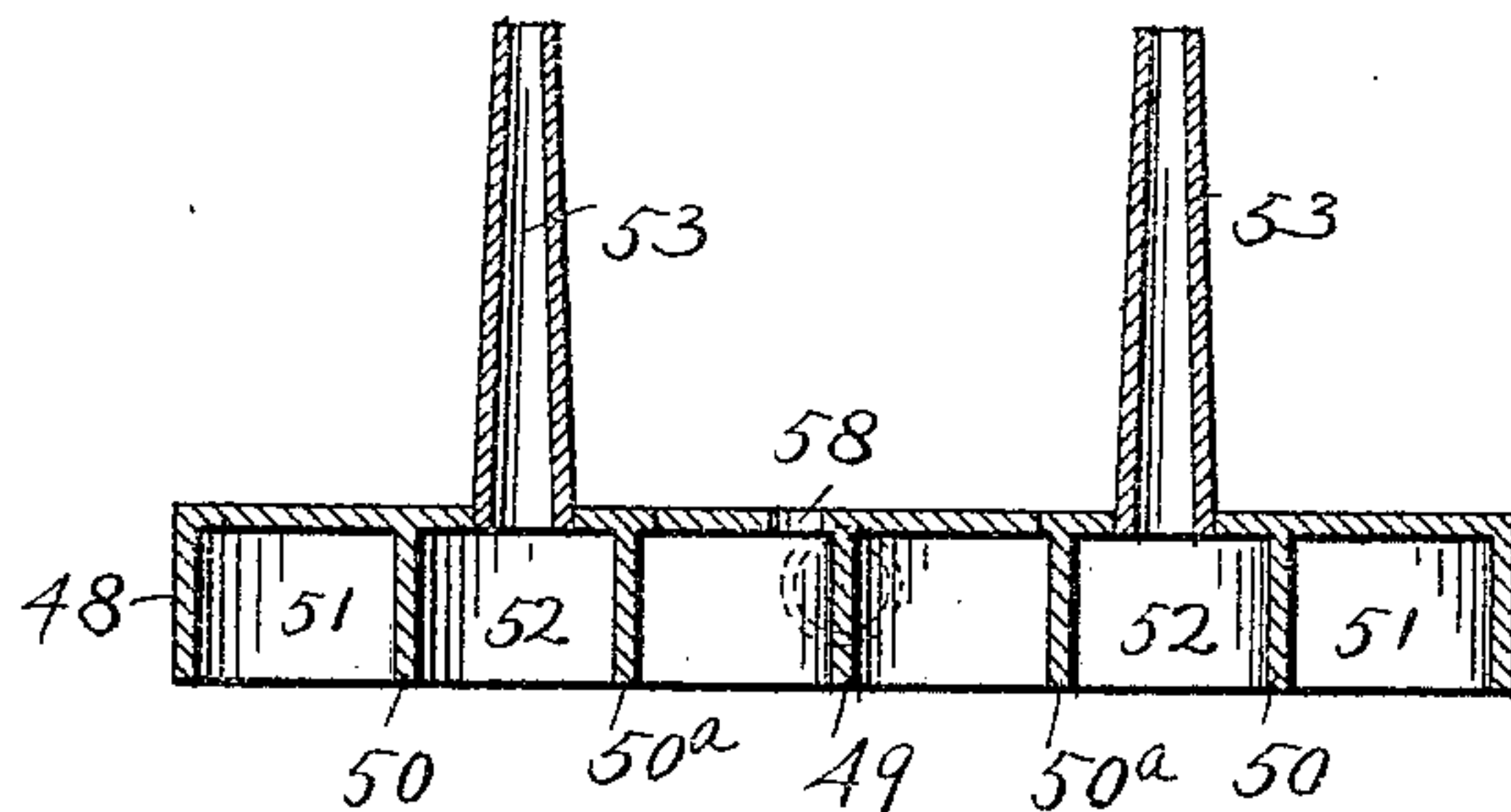


Fig. 7.



Witnesses.
E. B. Gilchrist
H. B. Sullivan

Inventor:
Jarvis A. Britton
By his attorneys
Thurston Bates Woodward

UNITED STATES PATENT OFFICE.

JARVIS A. BRITTON, OF CLEVELAND, OHIO.

INCUBATOR.

No. 904,599.

Specification of Letters Patent.

Patented Nov. 24, 1908.

Application filed October 21, 1905. Serial No. 283,715.

To all whom it may concern:

Be it known that I, JARVIS A. BRITTON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Incubators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to certain improvements in incubators, the principal objects thereof being to provide an efficient manner for distributing the heat and fresh air to each egg so as to avoid, as far as possible, the heating of eggs in certain parts of the apparatus to a higher degree than those in others; to provide a convenient and efficient manner of supplying artificial moisture to the eggs from a source exterior to the apparatus, thus avoiding the trouble of placing moisture pans, sponges and the like in the egg-chamber; to provide an improved egg-tray in which the eggs may be turned and cooled without removing said egg-tray from the apparatus other than drawing the tray out into position as described below; to provide a new and convenient way for placing a thermometer in the egg-tray where it shall register the desired temperature and at the same time be out of the way of the eggs, easily read, and readily removed; to provide an improvement in radiators adapted to heat the egg-chamber from a position directly above it, which shall by a system of flues, as described, perform this function in a much more perfect manner than heretofore, and at the same time be capable of being easily and thoroughly cleaned; and to provide a simple and convenient lamp holder not subject to the disadvantages inherent in those devices which are commonly used for this purpose.

Further objects and advantages of the invention will appear below.

Reference being 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 central longitudinal vertical section of an incubator constructed in accordance with the principle of my invention. Fig. 2 is a sectional view of the same on the line 2—2 of Fig. 1. Fig. 3 is a section on the line 3—3 of Fig. 2, but on a smaller scale. Fig. 4 is a fragmentary view of a detail. Fig. 5 is a sectional view on the

line 5—5 of Fig. 1. Fig. 6 is a bottom plan view of a portion of a heat distributing device, which constitutes a part of the invention. And Fig. 7 is a sectional view of the same on the line 7—7 of Fig. 6.

The device is shown as being provided with double walls 10, 11, between which is a packing 12 of any desirable non-heat conducting material. These walls extend to the top of the main portion of the apparatus and are provided at the bottom with cleats 13, for supporting a drawer 14 that serves as a nursery. This drawer is provided with a porous bottom 15, and the casing is provided with a door 16 through which the drawer may be withdrawn in order to take out the chicks. This drawer may be removed entirely from the apparatus for the purpose of transporting the chicks therein to the brooder and by closing the door 16 the egg-chamber will not seriously be cooled. Below this drawer is a partition 17 of porous material which is secured upon a sliding frame 18 supported on cleats, which frame is adapted to be drawn out either in the rear or front as indicated in dotted lines in Fig. 2. Above the drawer 14 is an opening 19 provided with a glass door 20; and within the incubator are cleats 21 for supporting a sliding egg tray frame 22 so that the frame can be drawn outwardly through the door opening 19. This frame is in itself rigid, and is provided in the center with a bar 23 separating the frame into two compartments. Each of these compartments is provided with an egg tray 24. These egg trays are pivotally connected with the bar 23 by means of hinges 25 or the like, and at their opposite ends they rest loosely on the sides of the frame so that they can be moved into position shown in dotted lines in Fig. 2, when the frame is drawn out. This construction permits the eggs in the trays to be very easily turned. To accomplish this, the frame is drawn out to the position indicated by dotted lines in Fig. 2, and while the trays are horizontal, all of the eggs in the row nearest the bar in one tray are removed, after which the free end of the tray is raised; whereupon all the eggs will roll over toward the attached end thereof and into the places formerly occupied by the eggs in the adjacent rows. The eggs removed from the position next to the center bar are then replaced in the tray in the vacant spaces along the outer edges of the tray. The same

action is repeated to turn the eggs in the other way. It is thought that this construction is a decided improvement over the stationary inclined trays in common use, and other turning devices, because all of the eggs, except the row removed, turn evenly and simultaneously, thus insuring that all of the eggs are properly turned.

Another advantage of the construction shown in the drawing, by comparison with the constantly inclined egg trays in common use is that the eggs in the incubator are all approximately at the same level consequently all at the same distance from the source of heat. The central bar 22 of the egg tray is also provided with a socket which receives a pin 25 which supports a thermometer 26. By this construction are avoided the objections which obtain in those apparatus in which the thermometer rests upon the eggs directly, and also those in which it is supported from above. This thermometer is always in proper position to register the temperature desired and it can readily be removed when the frame is taken from the apparatus, and can be seen and read through the glass door 19.

In order to provide for supporting the frame 21 when it is thrown out, as shown by dotted lines in Fig. 2, to permit the eggs to be turned, links 27 are provided, whose front ends are pivoted to the sides of the tray near its front ends,—which links have outwardly turned free ends which carry rollers 28 movable in horizontal grooves or ways 29 upon the inner sides of the apparatus. The front ends of these grooves are closed so that these rollers cannot be removed, and therefore these links hold up the front end of the frame when it is drawn out, as shown in dotted lines in Fig. 2. In order that the door opening 18 may not be left open when the frame is drawn out to this position, the rear of the frame 21 is provided with a back board 31, having narrow slots through which the link 27 preferably passes. This back board is of such size that it will close the rear of the opening 18 when the frame 21 is in its outer position, thus preventing the dissipation of heat.

The manner of supplying heat and fresh air to the eggs will now be described. The fresh air first enters the chamber 44 which is open at the bottom, and, as shown, surrounds the chimney or flue 39; said air passes over the semi-circular troughs or cups 62, which, if necessary, may be filled with water so that the fresh air on entering the apparatus will take up a certain amount of moisture from these troughs into the apparatus with it and eventually to the eggs. These troughs are hung directly to the chimney 39 by means of hooks 62^a which fit in eyes 39^a on the chimney so that they are easily removed and replaced in position. They are provided

with covers 63 swinging on a pivot, as shown in Fig. 5, so that the amount of water exposed to the ingoing air may be varied, thus increasing or reducing the amount of artificial moisture supplied to the eggs. The air passing up through the chamber 44 is heated in the customary way by contact with the chimney 39 and then passes through the pipe 45 which is connected directly with the chamber 44, and through the pipe 54 which, as described below, fits into pipe 45. It is discharged from the flaring upturned end of pipe 54 against the plate 56 which forms the bottom of the radiator 48, and consequently the top of the heat chamber 70. This radiator consists of a fixed sheet metal plate 56, and a rectangular sheet metal pan 48 inverted so that its sides rest upon said plate and the bottom of the pan forms the top of the radiator. The radiator is made thus in two sections (48 and 56) which are in no way joined permanently, so that the upper section 48, being fastened to a cover 64 having downwardly extending flanges 65 which rest above the wall of the casing below, may be removed by removing the cover 64 which is substantially the top of the incubator, thus leaving the plate 56 exposed to be cleaned of any accumulations of soot.

The arrangement for distributing the products of combustion within the radiator in a manner most suitable is as follows: Said products of combustion enter the radiator from the lamp chimney 39 through the pipe 42 which has a hood 43 projecting into the chimney. Fitting within the ends of the pipe 42 is a small pipe 47 secured to the top 65 and communicating with the radiator. This upper section of the radiator is provided with a central partition 49 depending from its top. This partition extends centrally into the pipe section 47, and, therefore, the products of combustion and the heated air will pass on both sides of the partition. Near the inlet are a pair of partitions 50, preferably in the form of lateral extensions of the partition 49, which are designed to direct the products of combustion and heated air to the exterior of the heat distributor along passages 51. These passages extend around the partitions 50, and inwardly again to the partition 49, where they extend along it toward the inlet of the radiator. The partitions 50 extend around the farther end of the casing and terminate in additional partitions 50^a which are parallel with the central partition 49 and extend nearly to the inlet end of the device where they terminate. The partitions 50^a are substantially an equal distance between the partition 49 and the partition 50, and consequently a passage 52 on each side is provided between them and the adjacent partitions 50^a, terminating in outlets 53 through which

the products of combustion are discharged into the outer air. Thus it is seen that the products of combustion and heated air will pass first around the exterior or outer parts

5 of the radiator, thus imparting the most heat to the sides and corners of the apparatus which would naturally be those parts of the apparatus which would need the greatest amount.

10 Since the top or cover 64 containing the upper section of the radiator must be removed to clean said radiator, I have made the pipe 47 to fit into the pipe 43 so as to act as a single pipe, but these two parts are in no

15 way permanently connected; and this is the case also with the pipes 54 and 45 respectively. The chimney 39 and the chamber 44 are incased in a substantial casing 41, containing a suitable insulation 40 around these

20 parts. This casing has an arm 42 which contains the pipes 46 and 45 within it, and being removably fitted in a recess in the side of the apparatus, as shown in Fig. 1, in such a manner that the parts 42 and 45 shall

25 make a perfect connection with the parts 47 and 54 respectively. This being the case, the entire outer heating apparatus, *i. e.*, the casing 41 with its inclosed flues, etc., may be removed from any connection with the appa-

30 ratus so that there will be nothing to hinder the removal of the top or cover 64. The fresh heated air after leaving the flaring pipe 55 passes downward through a porous cloth diaphragm 32 which is supported on

35 the cleats 81 and which performs the customary function, namely, to aid in the distribution of the heated air and to prevent drafts and accelerated movement of the air caused by the heated fresh air current, from

40 coming in contact with the eggs, in the egg chamber. The porous partition 17, through which the poisonous gases given off by the eggs during incubation find exit, consists in part of one thickness of cloth or felt, which

45 is fastened securely to the frame 10, and another similar thickness 17^a of cloth may be laid loosely in the frame and on top of the stationary thickness 17 so that when found desirable, this layer 17^a may be easily

50 removed and the density of the partition thereby reduced.

In order that the action of a thermostat or the like may be transmitted from the egg-chamber, (wherein said thermostat is generally located) to a lever as 60 which acts in the customary manner, raising and lowering a damper 67 over the chimney and which is situated in the customary manner on top of the apparatus, I provide a tube 58 which may

55 be located in any convenient place and which shall fit into and be fastened securely to the plate 56, and which shall pass through an opening in the top of the radiator section 48. At a suitable place upon this tube,

60 there is a flange 58^a upon which the top of

the upper section of the radiator rests when in place, thereby preventing the escape of gases and heat from the radiator around this tube.

The thermostat holder is a tube 71 which is secured to a plate 72 on the cover 64, and passes therefrom down into the egg chamber; and the rod 59 which is operated by the thermostat, and which in turn operates the lever 60, passes up through this tube 71.

75 Upon the outside of the frame of the apparatus is a bar 33 to which is hinged or pivoted a platform 34. This platform is provided with a link 35 having a hook 36 at its upper end. This hook engages an eye 37 located in a stationary position on the casing 41. The platform is designed to support a lamp 38 in the proper position with respect to a chimney 39. This support for the lamp is very convenient and much preferable to those employing springs, which are likely to become bent, and then to support the lamp in an imperfect manner. When it is desirable to remove the lamp, with the construction shown, it is merely necessary to

80 remove the hook 36 from the eye 37 and lower the platform, meantime taking the lamp from it. When restored to normal position, the lamp will fit under the chimney in an obvious manner.

I claim:

1. An incubator having an egg tray frame provided with a stationary bar having a socket, egg trays supported on said frame on opposite sides of said bar and pivotally connected therewith, and a thermometer having a downwardly extending pin adapted to fit in said socket whereby the thermometer is removably mounted upon the frame.

2. In an incubator, the combination of a casing having a door, a sliding egg tray frame mounted in the casing and capable of being withdrawn therefrom through said door, a back board on the rear of said frame adapted to close the door, a device for supporting the outer end of said frame when it is so far withdrawn that said back board is closing the door opening, and an egg tray supported on said frame.

3. An incubator having a casing, a sliding egg tray frame, ways in the casing above said frame, a link connected with one end of said frame and extending in an inclined position toward the other end, said link being provided with a projection adapted to slide in said ways, the ways terminating at such a point that when the frame is partly withdrawn from the casing the projection on the link will engage the end of the ways and the link will serve as a tie to support the outer end of the frame.

4. In an incubator, the combination of a casing having a door opening, a frame slidably mounted in the casing, means connected with the frame and casing for holding the

frame in horizontal position when partly drawn out through said door, the casing being provided with a second opening below the first, and a sliding nursery drawer located behind the second opening and adapted to be drawn therethrough.

5. In an incubator, the combination of a casing having a door opening, a frame slidably mounted in the casing, means connected with the frame and casing for holding the frame in horizontal position when drawn out through said door, the casing being provided with a second opening below the first, a nursery drawer being located behind the second opening and adapted to be drawn therethrough, and a porous partition below said drawer—which partition is composed of one fixed layer and a removable layer.

6. In an incubator, the combination of a casing containing an egg chamber and, below that, a sliding drawer with a porous bottom constituting the nursery, and, below that, the sliding frame having a porous cloth diaphragm secured to it and constituting the bottom of the incubator casing and a removable layer of cloth upon the diaphragm first mentioned.

7. In an incubator, the combination of a casing containing a fresh air chamber, a vertical heat conducting chimney located outside of said casing and having an annular chamber surrounding the same, which chamber is open at its bottom,—a pipe connected with the upper end of said annular chamber and extending into the fresh air chamber, and moisture pans supported close below the entrance to said annular chamber, and adjustable covers to said moisture pans.

8. In an incubator, the combination of a casing containing a fresh air chamber and a radiator forming the top of said chamber, with a fresh air inlet pipe which enters said chamber through one side thereof and has an upwardly turned and widely flaring open inner end, which lies close below the bottom plate of said radiator.

9. In an incubator, the combination of a casing having its top closed by a metallic plate secured thereon, a cover removably secured upon said casing and containing an inverted metallic pan like radiator having depending sides, which when the cover is in place, engage with said metallic plate and form a heat radiator, means for discharging heated fluid into said radiator, and means for permitting the escape of said fluid from said radiator.

10. In an incubator, the combination with the two main parts, to wit, an open top casing and a removable cover therefor, of a metallic plate secured over the top of the casing, and an inverted pan like metallic radiator member secured in said cover, said members having depending marginal flanges which when said cover is on rest upon said

metallic plate, thereby forming a closed radiator,—there being an inlet to said radiator through one of said depending flanges, and an outlet therefor through the top of said upper radiator member.

11. In an incubator the combination of a casing containing an egg chamber, a fresh air chamber above the egg chamber, and a radiator which is located above the fresh air chamber and has for its bottom a metallic plate secured upon the top of said casing, a porous partition separating the fresh air chamber from the egg chamber, a removable cover within which the upper part of said radiator is secured, a tube extending up through the radiator and into the cover without communicating with said radiator, and a tube secured at its upper end to said cover and projected from its point of support downward through the tube first named, into the egg chamber.

12. In an incubator, a casing containing an egg chamber a metallic plate secured upon its open top, which plate has a hole through it, a cover secured upon said casing and containing a chamber whose lower edges engage with said plate when the cover is in place, an upwardly extended tube secured to said plate over the hole therein and extending up through said cover, said tube having a flange which engages with the top plate of the chamber in said cover, a tube secured at its upper end to said cover and extending from its point of support down through the tube first named into the incubator.

13. An incubator, having a heat radiator which is provided with an inlet through one end, a central partition in said radiator extending from said inlet to the opposite end of the radiator, and a curved partition on each side of the central partition for leading the heat in a sinuous passage through the radiator.

14. An incubator having a heat radiator provided with an inlet, a central partition from said inlet to the opposite end of the radiator, a side partition on each side of the central partition and adjoining the same at a point near said inlet, each of said side partitions extending outwardly from the central partition for a certain distance and then extending parallel thereto, to a point near the opposite end of the radiator, said side partitions then extending toward the central partition and finally projecting backward on lines parallel with the central partition to a point near the opposite end of the side partitions.

15. In an incubator, the combination of the two main sections, to wit, an open top casing and a removable cover therefor, with a metallic plate secured over the top of the casing, an inverted pan like metallic radiator member secured in said cover and provided with depending marginal flanges which en-

gage with said metallic plate when the cover
is on, an inlet to the radiator thereby formed
through one of the end flanges thereof, a
flange depending centrally from the top of
5 said upper radiator member and extending
from the opposite end flange to a point adja-
cent to the middle of said inlet opening, the
flanges which extend laterally from the cen-
tral flange at the point near to said inlet end,
10 which laterally extended flanges are bent and
extended along parallel with said central
flange and are again looped inward toward
said central flange and again extended in a
direction parallel thereto,—all of said de-

pending flanges being of such height that 15
they engage with said metallic plate when
the cover is on the casing,—and outlets from
said radiator chamber extending through
the top of the upper member thereof from
the loops connecting two parallel members 20
of the flanges on opposite sides of the central
flange.

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

JARVIS A. BRITTON.

Witnesses:

ALBERT H. BATES,
E. L. THURSTON.