

W. H. SOMERSALL.

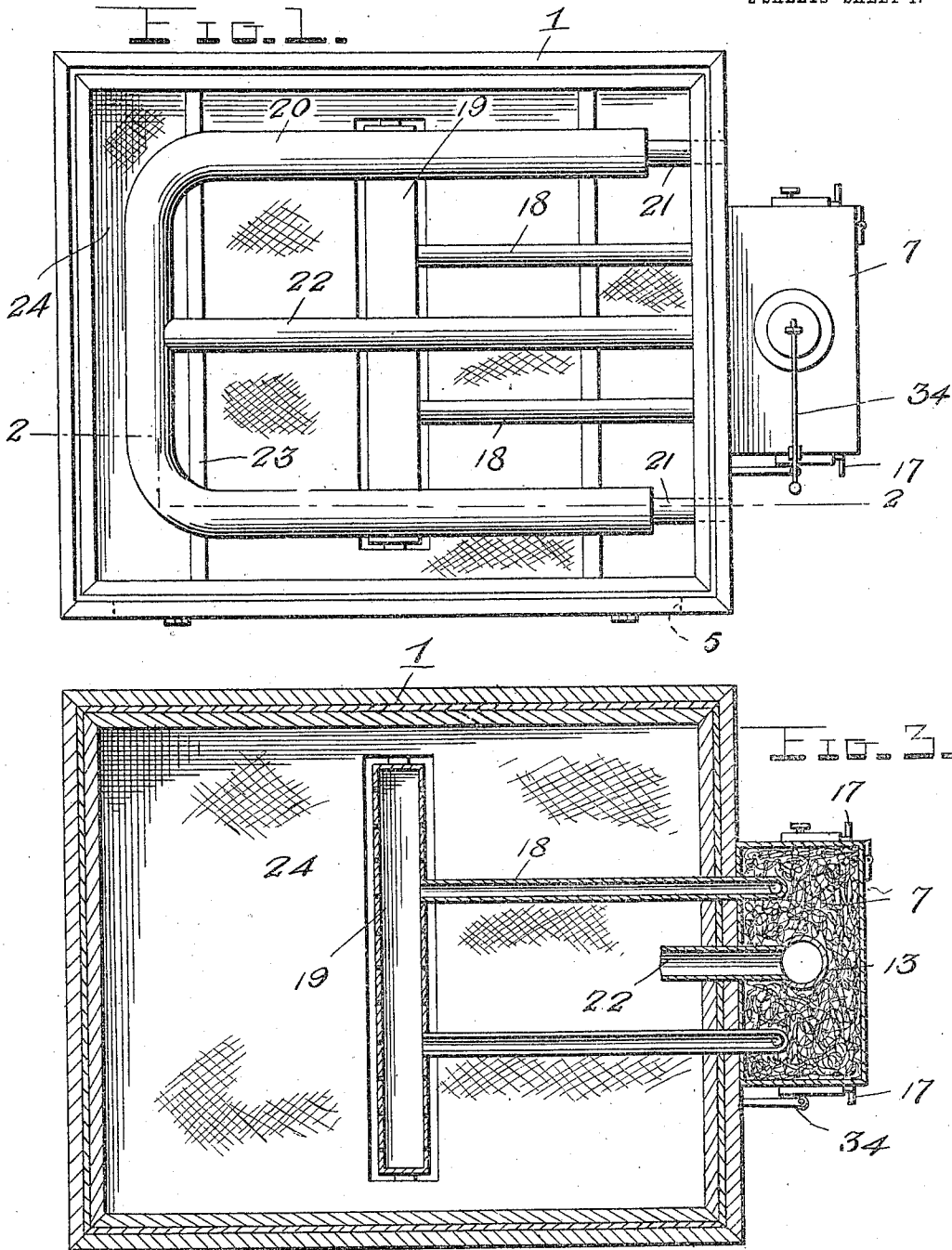
INCUBATOR.

APPLICATION FILED JAN. 27, 1909.

948,906.

Patented Feb. 8, 1910.

2 SHEETS—SHEET 1.



Witnesses
Chas. L. Griesbauer.
C. H. Griesbauer.

by

Inventor
Wm. H. Somersall.

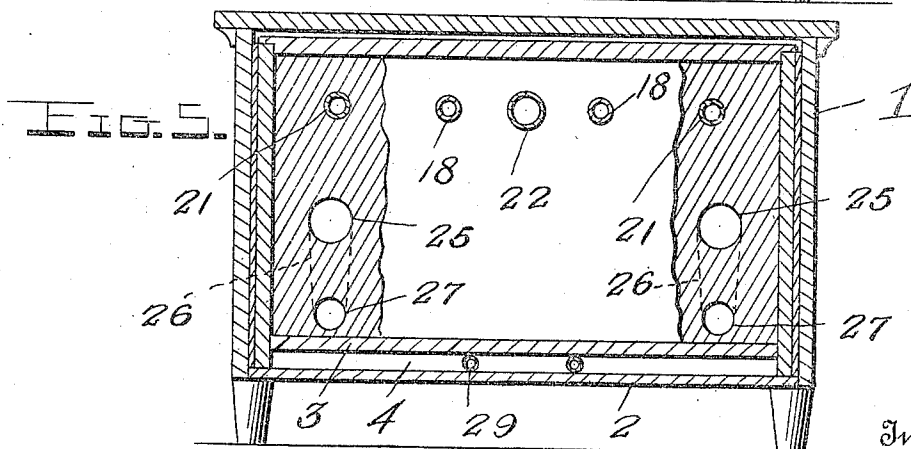
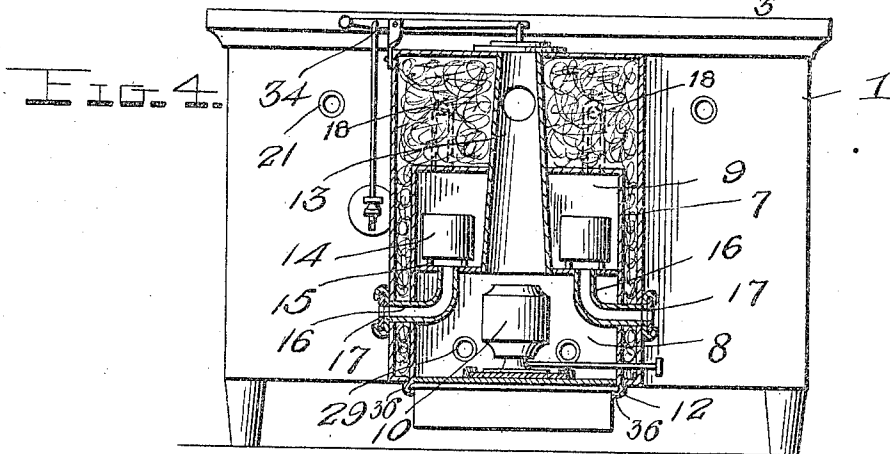
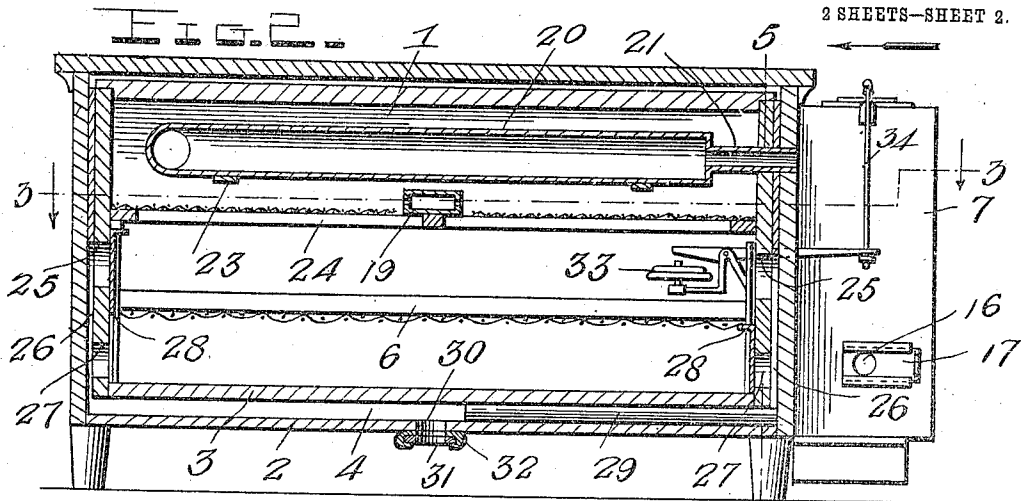
A. B. Williams & Co.
Attorneys

W. H. SOMERSALL.
INCUBATOR,
APPLICATION FILED JAN. 27, 1909.

948,906.

Patented Feb. 8, 1910.

2 SHEETS—SHEET 2.



Witnesses
Chas. L. Griesbauer.
C. H. Griesbauer.

Inventor
Wm. H. Somersall.
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM H. SOMERSALL, OF BOSTON, MASSACHUSETTS.

INCUBATOR.

948,906.

Specification of Letters Patent.

Patented Feb. 8, 1910.

Application filed January 27, 1909. Serial No. 474,439.

To all whom it may concern:

Be it known that I, WILLIAM H. SOMERSALL, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Incubators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in incubators.

The object of the invention is to provide an incubator having means whereby fresh air is warmed and supplied to the incubator and means whereby the circulation of fresh air may be readily controlled.

With this and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a top plan view of an incubator with the inner and outer covers removed to more clearly show the interior arrangement of the parts; Fig. 2 is a vertical sectional view on the line 2—2 of Fig. 1; Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 2; Fig. 4 is a vertical section through the lamp chamber and heating compartment looking toward the end of the incubator; Fig. 5 is a vertical sectional view on the line 5—5 of Fig. 2 looking in the direction of the arrow.

Referring more particularly to the drawings, 1 denotes the body portion of an incubator which is constructed of inner and outer walls between which is arranged a suitable packing. The body of the incubator is provided with an outer or lower bottom 2 and an inner or false bottom 3. Between the bottoms 2 and 3 is arranged an air space 4 and within the body portion thereof is arranged the usual egg supporting tray 6, said tray preferably consisting of an open frame having a wire netting covering on which the eggs are supported.

On one end of the incubator is arranged a heating compartment 7, in the lower portion of which is arranged a lamp chamber 8 above which is arranged an air heating and moistening chamber 9. In the lamp chamber is arranged a suitable lamp 10, the reservoir of which is slidably engaged with suit-

able supporting guides 12 arranged beneath the bottom of the lamp chamber as shown. The bottom of the lamp chamber as well as the partition between said chamber and the air heating chamber and the top of said air heating chamber are preferably formed of tin or other sheet metal. Through the heating chamber is arranged the chimney or flue 13 of the lamp said flue extending through the top of the compartment 7 as shown. In the heating chamber 9 on each side of the flue 13 is arranged a water tank 14, said tanks being in the form of open cups or receptacles which are supported above the floor of the air heating chamber by short legs 15.

With the floor of the heating chamber is connected the inner ends of air inlet or supply pipes 16 which are preferably curved or in the form of elbows, the outer ends of the pipes 16 opening through the opposite sides of the compartment 7, said open ends of the pipes are adapted to be closed or the opening varied in size by means of slidably mounted cover plates 17 whereby the admission of fresh air to the air heating chamber 9 may be regulated. The air supply pipes 16 pass through the opposite sides of the lamp chamber 8 before entering the air heating chamber 9 and the air in passing through said pipes may be warmed to a slight degree by radiation of the heat from the lamp.

The air after entering the heating chamber 9 is further heated by the radiation of heat from the flue 13 which passes through the chamber 9 and is also moistened by contact with the water in the open tanks 14 and after being thus heated and moistened said air is conducted from the upper portion of the heating chamber 9 through air conducting pipes 18 to a heat distributing box or casing 19 which is arranged in the upper portion of the incubator substantially midway between its ends. The box or casing 19 is preferably oblong in shape and extends transversely through the upper portion of the incubator as is clearly illustrated in Fig. 3 of the drawings. The distributing casing 19 is provided in its opposite sides with a series of air discharging ports through which the moist heated air passes into the upper portion of the incubator. By this arrangement, the air is evenly distributed throughout said upper portion of the incubator. In the upper portion of the incubator around the air conducting pipes and above

the heat distributing box 19 is arranged a heat conducting pipe 20, said pipe being substantially U-shaped and extending through the length of the incubator. The ends of the pipe 20 are reduced adjacent to one end of the incubator, as shown at 21, and said reduced portions of the pipe 20 pass through said end of the incubator. The inner curved end of the heat conducting pipe 20 is connected to the heat flue 13 of the lamp by a heat conducting pipe 22 whereby the fumes and heat from the lamp are conducted to the heating pipe 20 and pass around through each side of the same and are discharged through the reduced ends 21. The upper portion of the compartment 7 above the air heating chamber 9 and around the flue 13 and the outer ends of the air conducting pipes 18 is arranged a packing of asbestos or mineral wool. The heating pipe 20 is preferably supported in position in the upper portion of the incubator by means of metal cross strips 23.

Below the heating and the air conducting pipes and distributing box is arranged a heat diffuser 24 which preferably consists of an open frame having a covering of burlap or other suitable fabric. The heat diffuser 24 is arranged a suitable distance above the egg tray and through said diffuser the heated air from the upper portion of the incubator passes over the tops of the eggs. The circulation of the air over the eggs after passing through the diffuser 24 is controlled by means of air ports 25 which are arranged in each end of the incubator and adjacent to the front and rear sides of the same. The ports 25 communicate with air conducting passages 26 which are formed in the inner wall of the ends of the incubator. The passages 26 communicate at their lower ends with the space 4 between the lower and false bottoms 2 and 3 of the incubator. The passage 26 is also communicate through ports 27 with the nursery space beneath the egg tray. The ports 25 and 27 are adapted to be opened and closed by means of sliding cover plates 28 which are held in operative position against the inner sides of the ends of the incubator by suitable guides as shown, said plates being of such length that one or the other of the ports 25 or 27 may be opened or closed but not both at the same time. By means of the cover plates 28, the ports 25 may be closed thus causing the air to pass through the eggs to the lower or nursery compartment below the egg tray. The ports 25 are thus closed and the air deflected downwardly through the egg tray, at the close of the hatch, when the young chickens are coming out and drop into the nursery space so that they will be supplied with the proper amount of fresh air. When the air has thus passed through the egg tray, it is conducted from the nursery space through

the ports 27 into the passages 26 and from thence to the space 4 between the floors of the incubator. At the beginning of the hatch, when the heated air is needed at the tops of the eggs, the cover plates are moved downwardly to close the ports 27 and the air thus caused to circulate in the space above the egg tray and to pass out of the ports 25 which are now open and into the passages 26 from whence it is conducted to the space 4 between the floors.

In the space 4 is arranged air conducting pipes 29 which extend from substantially mid-way between the ends of the incubator through one end and communicate with the lamp chamber 8 thereby supplying the lamp with sufficient air. By thus connecting the space 4 with the lamp chamber, the lamp will cause a draft through the pipes 29 thus facilitating the circulation of the air through the incubator. In the beginning of the hatch, when a small quantity of air is needed and the cover plates 17 of the air supply pipes 16 are partly closed there would not be sufficient air to promote combustion in the lamp chamber and in order to overcome this deficiency, I provide an air inlet port 30 in the lower bottom of the incubator, said air supply port communicating with the space between the floors so that air may be admitted thereto and conducted therefrom by the pipes 29 to the lamp chamber. The port 30 is opened and closed by means of the cover plate 31 which is slidably mounted in suitable guides 32 on the under side of the lower floor of the incubator, as shown.

In the space above the egg tray is arranged the usual thermostat 33 to which is connected suitable damper operating levers and rods 34 which connect with a damper plate 35 arranged above the heat compartment 7 in position to automatically open and close the upper end of the lamp flue 13 thus automatically regulating the flow of heat or fumes from the lamp through the pipe 22 to the heating pipe 20.

In an incubator constructed as herein shown and described the warm moist air passes over the tops of the eggs and from thence between the double floors of the incubator from whence it is drawn to supply the lamp with oxygen. By this arrangement, the warmed air may be caused to pass over the eggs instead of passing down between them thus keeping the eggs warmer at the top than at the bottom. This arrangement is of great advantage as the heated air is supplied to the top of the egg where it reaches the growing germ or embryo which always moves to the top or uppermost part of the egg irrespective of the position in which the egg is placed. The heat when maintained above the eggs does not affect the rest of the contents of the egg which would be materially injured if the tempera-

ture required for the germ were continuously supplied to the lower portion of the egg. The eggs are sufficiently warmed, however, by the radiation of heat throughout the incubator. At the end of the hatch, when the chicks are coming out and drop into the nursery below, the upper air regulating ports are closed so that the air is then forced downwardly through the egg tray into the nursery compartment to supply the newly hatched chicks with all the fresh air needed. It will thus be seen that the air supply and circulation is entirely under control of the operator as is also the supply of moisture to the air.

It will be seen from the foregoing that an incubator constructed as herein shown and described has the benefit of the direct radiation from the heat conducting tubes as well as the heat of the warm, moist air from the air heating and moistening chambers, thereby utilizing all of the heat energy of the lamp. This arrangement enables the use of a comparatively small lamp or burner and a consequent saving of fuel.

The reservoir of the lamp is preferably slidably supported beneath the floor of the lamp chamber 8 by means of guide flanges 36 while the burner portion is engaged with and projects through a slot in the bottom of the lamp chamber, this slot being closed by a small slide 37 as shown in Fig. 4 of the drawings. By this arrangement the reservoir of the lamp is thoroughly protected from the radiation of the heat from the flame.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention as defined in the appended claims.

Having thus described and ascertained the nature of my invention, what I claim as new and desire to secure by Letters-Patent is:

1. In an incubator, a heating compartment having arranged therein a closed lamp chamber and an air heating and moistening chamber, an air supply pipe to connect said air heating and moistening chamber with the outside air, heat conducting pipes connected to said air heating and moisture chamber and adapted to conduct the moist heated air into the incubator, means to distribute said air in the upper portion of the incubator, and means to control the circulation of the air through the incubator to the lamp chamber.

2. In an incubator, a heating compartment

having therein a closed lamp chamber and an air heating chamber, air conducting pipes adapted to supply air to said heating chamber, means to regulate the passage of air through said pipes to said chamber, means to moisten the air in said chamber, an air distributing box arranged in said incubator, air conducting pipes to connect said air heating chamber with said distributing box, an air diffuser arranged below said distributing box and above the eggs in the incubator, and means to control the circulation of the air passing through said diffuser to the last chamber whereby the air may be circulated above the eggs or forced down between the same.

3. An incubator having arranged in its opposite ends upper and lower air ports and air conducting passages connecting said ports, an egg supporting tray arranged in the incubator between the upper and lower air ports, an inclosed air heating and moistening mechanism, means to conduct the moist heated air from said mechanism to the upper portion of the incubator, a heat diffuser arranged below said distributing means and above said egg tray, and cover plates arranged to open and close said air ports whereby the moist heated air after passing through said diffuser may be circulated above the eggs in said tray or forced through the tray into the heating mechanism.

4. An incubator having arranged in its lower side an air space and in its opposite ends upper and lower air ports connected by an air passage communicating with said air space, an inclosed air heating mechanism, an air distributing mechanism adapted to conduct the heated air from said heating mechanism and to distribute the same in the upper portion of the incubator, cover plates adapted to be shifted to open and close the air ports communicating with said air passage whereby the heated air may be caused to circulate above the eggs or below the same, means whereby the air after thus being circulated is conducted to the air heating mechanism and means to admit fresh air to the conducting means.

5. In an incubator, a heating compartment having therein a closed lamp chamber and an air heating and moistening chamber, means to conduct fresh air to said moistening and heating chamber, water tanks arranged in said chambers whereby the air entering the same is moistened, a lamp flue connected with said lamp chamber and extending through said air heating chamber, a heating pipe arranged in the upper portion of the incubator, means to operatively connect said heating pipe with said lamp flue whereby the fumes and heat of the lamp are conveyed to said heating pipe, a heat conducting and distributing device connected

with said air heating and moistening chamber, a heat diffuser comprising a fabric covered frame arranged beneath said distributing mechanism, means whereby the air after passing through said diffuser is caused to circulate above the eggs or is forced between the same to the closed lamp chamber, and means to admit fresh air to the circulating means.

6. An incubator having an outer bottom or lower bottom and a false bottom arranged to provide an air space between the same and having in its opposite ends a plurality of air conducting passages communicating at their lower ends with said air space, said passages having communicating therewith upper and lower air ports, and said air space having communicating therewith an air port whereby the outside air may be admitted thereto, cover plates adapted to be shifted to open and close said air ports, an inclosed air heating and moistening mechanism, means to conduct the heated moist air

from said mechanism to the incubator, an air distributing mechanism, a heat diffuser arranged beneath said distributing mechanism, an egg tray arranged below said diffuser and spaced therefrom to provide an upper egg space, and a lower nursery space, and a plurality of heat conducting pipes arranged in the air space between the floors of the incubator whereby the air after passing from said egg space or nursery space through the ports and passages in the ends of the incubator to the air space between the floors is conducted from said space to supply air for combustion to the inclosed air heating mechanism.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM H. SOMERSALL.

Witnesses:

ALICE C. HALL,
ROSA STEFFENS.