

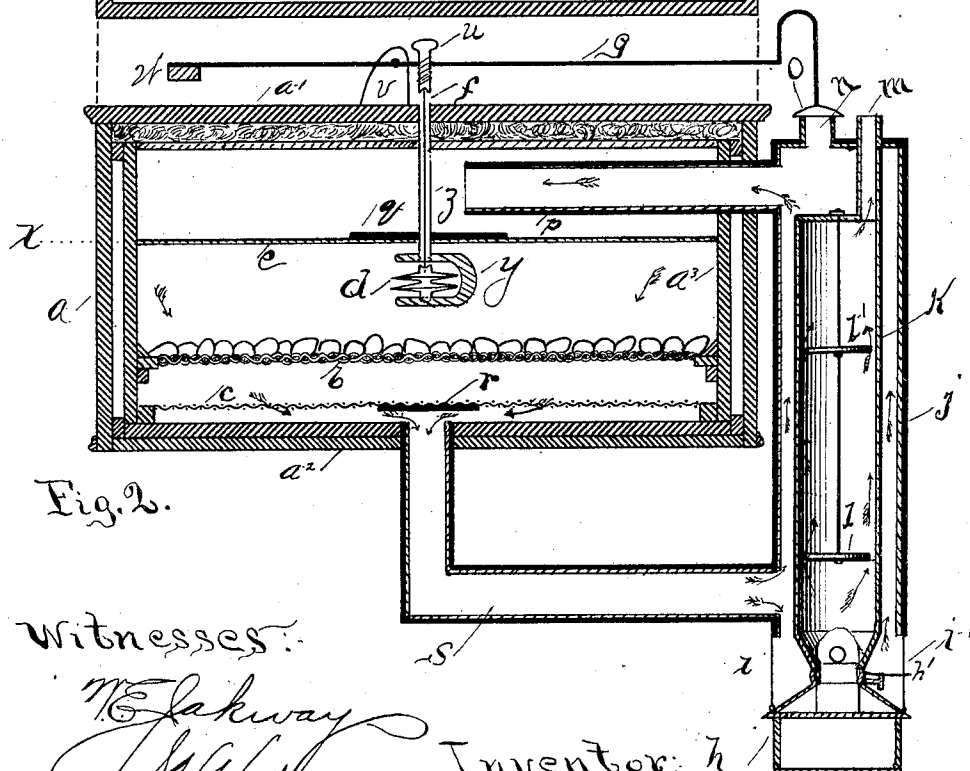
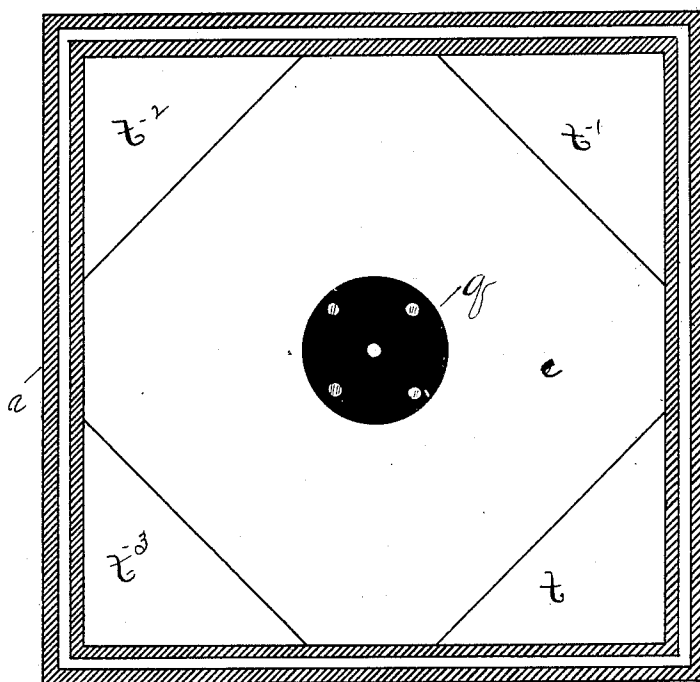
No. 789,719.

PATENTED MAY 16, 1905.

J. M. DAY.
INCUBATOR.

APPLICATION FILED SEPT. 21, 1903.

2 SHEETS—SHEET 1.



Witnesses:

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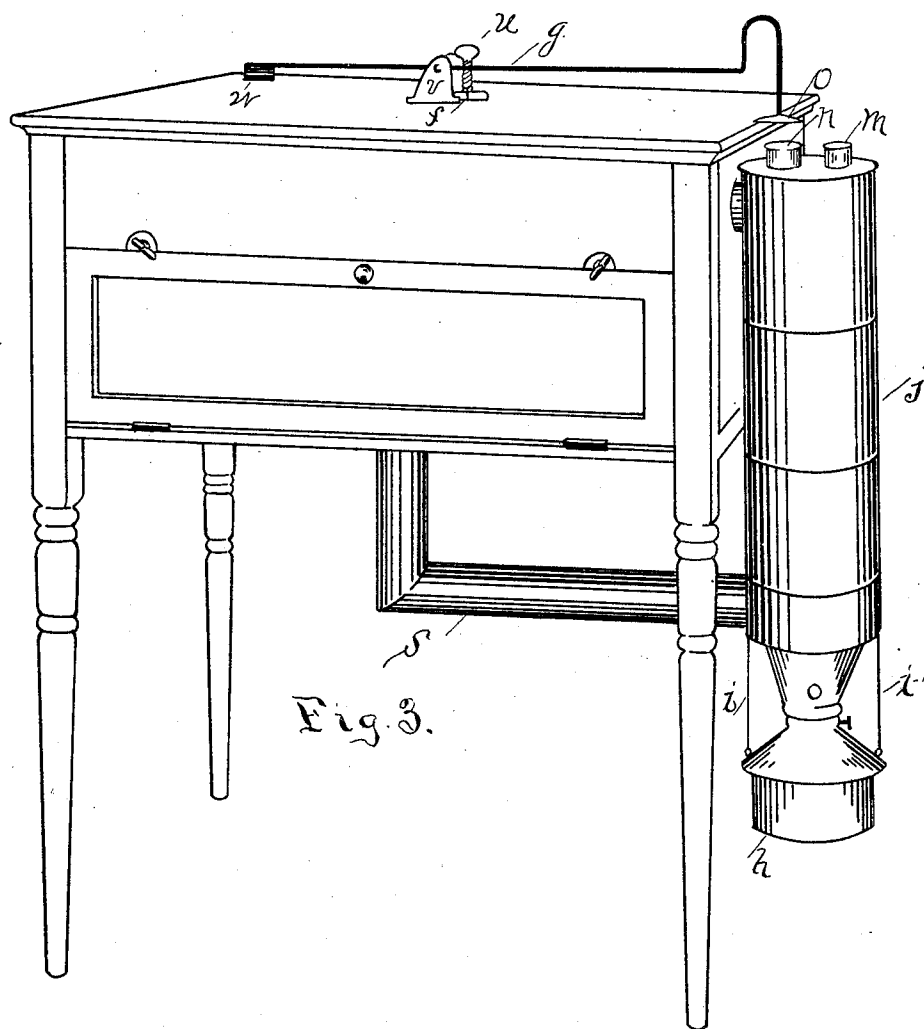
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN M. DAY, OF LINCOLN, NEBRASKA.

INCUBATOR.

SPECIFICATION forming part of Letters Patent No. 789,719, dated May 16, 1905.

Application filed September 21, 1903. Serial No. 174,056.

To all whom it may concern:

Be it known that I, JOHN M. DAY, residing at No. 2540 North Twelfth street, in the city of Lincoln, Lancaster county, Nebraska, have
 5 invented certain useful Improvements in Incubators; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to
 10 make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to improvements in incubators.

15 The principal object of this invention is to provide a simple and inexpensive incubator which can be uniformly heated at a reasonable cost and which will furnish to the eggs hatching therein an abundance of fresh air with
 20 means of controlling the circulation of the same through the egg-chamber, so as to control the temperature of the eggs and the evaporation of the same.

25 The invention consists in the construction, arrangement, and combination of parts, as hereinafter set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

30 Figure 1 is a horizontal sectional top view of the incubator-casing and contents on line *x* of Fig. 2. Fig. 2 is a vertical sectional front view of an incubator constructed according to my invention cut through the middle, showing the forms and relative positions of the operative parts, while Fig. 3 is a perspective
 35 view of my incubator as it appears when complete.

40 Like letters of reference designate corresponding parts in all the figures of the drawings.

45 *a*, *a'*, *a''*, and *a'''* designate the left side, top, bottom, and right side, respectively, of the casing, which is constructed as shown in the drawings, but may be constructed in any suitable manner so as to make it impervious to
 50 air and prevent the escape of heat from within the casing. Inside this casing near the bottom is arranged a receptacle or tray *b*, with a bottom of wire-cloth or other coarse porous
 55 fabric upon which the eggs are placed in hatch-

ing disposed in such a manner that it may be readily removed to facilitate caring for the eggs. Some distance above this receptacle is secured a metal diaphragm *c*. (Shown on line
 5 *x* of Fig. 2 and the outlines of which are shown in Fig. 1.) This diaphragm is cut out at the corners, leaving the openings *t*, *t'*, *t''*, and *t'''*. (Shown in Fig. 1.) Upon this diaphragm is secured a circle of asbestos paper or other suitable material *q* for the purpose
 60 of insulation.

Near the bottom of the casing is drawn a screen *e*, composed of heavy woolen or felt cloth, underneath the center of which and
 65 some little distance above the floor is secured a small circular diaphragm *r*, composed of asbestos paper or other suitable material. Attached to the side of the casing is the drum *j*,
 70 (shown in Figs. 2 and 3,) with a pipe *p* leading from the side of the top of said drum through the side wall of said casing and terminating near the center of said casing above
 75 the top of the diaphragm *c* and over the insulation *q*. A similar pipe *s*, beginning in the center of the bottom of the casing directly under the diaphragm *r*, extending downward
 80 and to the right, is connected with the lower part of the drum *j*. This drum *j* and the pipes *p* and *s* are covered with asbestos paper or other suitable material for the purpose of insulation. This drum *j* is open at the bottom
 85 to admit of the free entrance and escape of air, and there is an opening *n* in the top covered by a damper *o*, suspended on a lever *g*, balanced by a weight *w* on the fulcrum *v*, so that the damper *o* will rest lightly over the opening *n*. The set-screw *u* being threaded
 90 in the lever *g*, so that it may be turned upward or downward at will, is used for the purpose of regulating the temperature in the hatching-chamber. A tube *z*, secured to the
 95 top of the incubator, passes downward through said top and through the diaphragm *c*, and suspended thereto is a small keeper *y*, in which keeper is set the thermostat-disk *d*, having a small cup-shaped receptacle in the top thereof
 100 into which drops the wire *f*, while the upper end of the wire *f* is inserted in a small cavity in the lower end of the set-screw *u*.

On the inside of the drum *j* is situated a

thin metal drum *k*, so disposed that the periphery of the drum *k* is parallel with, adjacent to, but not touching the inside of the drum *j*. From the top of the drum *k* rises an outlet-tube *m*, which passes through the top of the drum *k*. Suspended on the inside of the drum *k* are two flat circular-shaped disks *l* and *l'*, suspended by a wire from the top of said drum, which disks are somewhat smaller in diameter than the diameter of the drum *k* and are disposed in said drum *k* in such a manner that the periphery of said disks will be equidistant from the inside wall of said drum *k* at all points. The disk *l* is disposed in said drum at a point on a level with or slightly above the point where the pipe *s* enters the drum *j*, while the disk *l'* is placed about on a level with the egg-tray *b*. The lamp *h* is connected with the lower part of the drum *k*, which forms a flue for said lamp, the lower part of said drum *k* being received by the burner *h'*, attached to said lamp, and the lamp being suspended and held in place by the wires *i* and *i'*, attached to the lower part of the drum *j*. It will thus be seen that when the lamp *h* is lighted the heat from the flame rises and comes in contact with the disk *l*, where it is deflected to the side walls of the drum *k*, passing upward close to the side walls of the drum *k* until it passes the disk *l'*, after which the vitiated air, having thrown off the greater portion of the heat, passes outward through the tube *m* and escapes. In the meantime the heat being thrown off through the surface of the drum *k* from a point nearly opposite the disk *l* to a point nearly opposite the disk *l'*, between the drums *j* and *k*, rises and passes into the upper part of the incubator-casing through the pipe *p* and is discharged into the upper part of the casing near the center. The insulation *q* prevents the excessive heat in the center above the diaphragm being radiated through the diaphragm *e* to the regulating-disk, while the diaphragm causes the heated air to be deflected and passed downward near the side walls and corner of the casing through the openings *t*, *t'*, *t''*, and *t'''*, where it filters slowly through the bottom of the tray *b* about the eggs, while the screen *c* prevents the too-rapid evaporation of the eggs by reason of the fact that it diffuses the air about the eggs, thus preventing drafts, and at the same time causes an increase in the tension of the air surrounding the eggs, while the diaphragm *r* causes the air passing through the screen *c* to be drawn off through the pipe *s* equally from all directions instead of being drawn through in a current opposite the opening.

It will be seen that when the most intensely heated air, which is being thrown off below the level of the screen, is forced through the pipe *p* without interruption the tension of the air above the screen *c* is increased, preventing the excessive evaporation of the eggs, which

would otherwise occur by reason of the increased temperature. In colder weather a greater amount of warm air must necessarily pass through the hatching-chamber than in warmer weather, and this increased flow of air would under ordinary circumstances increase the evaporation of the eggs. With an unrestrained ingress and a properly-restrained egress of the air the tension of the air about the hatching eggs will be increased as the flow of air increases, and this increased tension will to a large extent counteract the otherwise evil effects of the more rapidly moving air, and the evaporation will continue approximately uniform. The heavier gases thrown off by the hatching eggs being heavier than the air fall upon the screen and are forced through and pass downward with the air through the pipe *s*, where they come in contact with the heated surface of the drum *k*, where the air is purified and rises and passes back into the casing, the gases which are heavier meantime falling and escaping, while fresh air rises through the opening between drums *j* and *k* to take their place.

The regulating device is such as is in common use for such purposes and forms no part of my present invention, but is shown solely for the purpose of illustrating the manner in which the heat is controlled in the casing. The set-screw *u* of the regulator is adjusted so that the wire *f* will press upward against it and raise the damper *o* when the heat in the incubating-chamber becomes excessive in the slightest degree. When the damper *o* rises, as is shown in Fig. 3, the heated air between the drums *j* and *k* rises and passes outward through the outlet *n*, while the cool air from below rises to take its place, thus preventing the heat in the incubating-chamber from becoming sufficiently excessive to injure the hatching eggs.

Having thus fully described my invention and the construction and operation of the same, what I claim to be new, and desire to secure by Letters Patent, is the following:

1. In an incubator the combination of a casing, a hot-air drum adjacent to said casing, a hot-air pipe connected with said drum, extending through the side wall of said casing near its top, an opening out of the top of said hot-air drum, a pipe extending out of the bottom of said casing connected with said hot-air drum, a second hot-air drum inside of said first-mentioned drum, a tube connected with said inside drum, extending through the wall or top of the outside drum, a deflecting disk or disks so disposed in said inside drum that the periphery of said disk or disks approaches the side wall of said drum equally distant at all points, and means for connecting a lamp to said inside drum, substantially as described.

2. In an incubator the combination of a casing, means of supplying heated air in the upper part of said casing, an egg-receptacle in

the lower part of said casing, a deflecting-diaphragm arranged horizontally inside said casing between said heat-supply and said egg-receptacle, an opening in the bottom of said casing, a screen arranged near the bottom of said casing between said egg-receptacle and said opening in the bottom of said casing, and a deflecting-diaphragm near to and above said opening in the bottom of said casing, substantially as described.

3. In an incubator, the combination of a casing, a hot-air drum connected by means of a pipe with the upper part of said casing, an outlet-opening at or near the top of said drum, a smaller drum inside said first-mentioned drum, a tube connected with said inside drum extending through the top of said outside drum, a disk or disks smaller in diameter than the diameter of said inside drum so arranged in said inside drum that the periphery of said

disk or disks will approach the inside wall of said inside drum equidistant at all points, a pipe extending out of the bottom of said casing connected with said outside drum, an egg-receptacle in said casing, a deflecting-diaphragm disposed between said egg-receptacle and first-mentioned pipe, a porous screen arranged in the bottom of said casing underneath said egg-receptacle, and a diaphragm larger than the opening in the bottom of said casing arranged over and above said opening, and means of controlling the heat in said casing, substantially as described.

Witness my hand this 16th day of September, A. D. 1903.

JOHN M. DAY.

Witnesses:

W. E. JAKWAY,
S. H. HOYT.