(No Model.) 2 Sheets—Sheet 1.

A. KERR.

INCUBATOR.

No. 532,278. Patented Jan. 8, 1895.

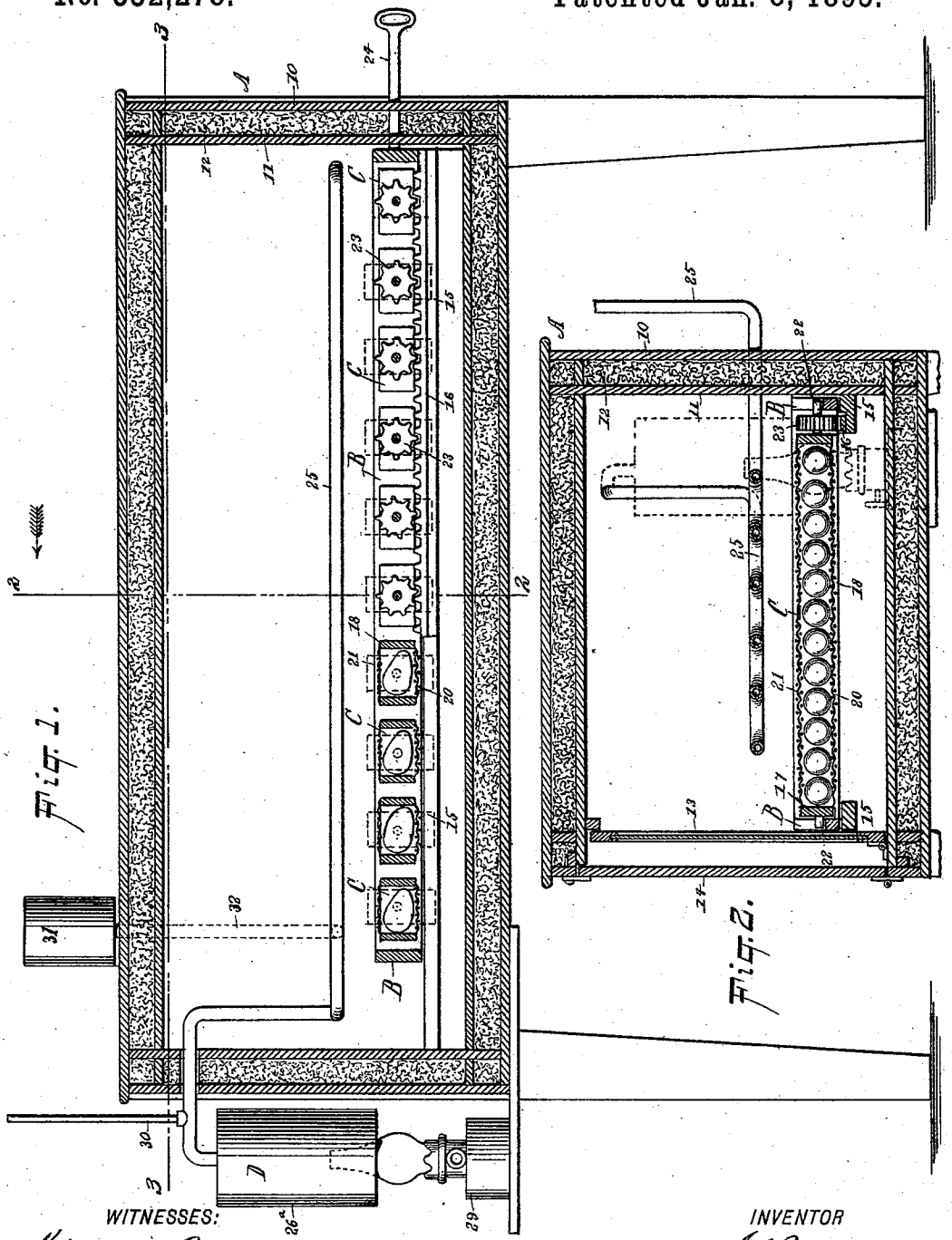

Fig. 1.

Fig. 2.

WITNESSES:

William Gaebel.

J. Fred Acker.

INVENTOR

A. Kerr

BY Munn & Co

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

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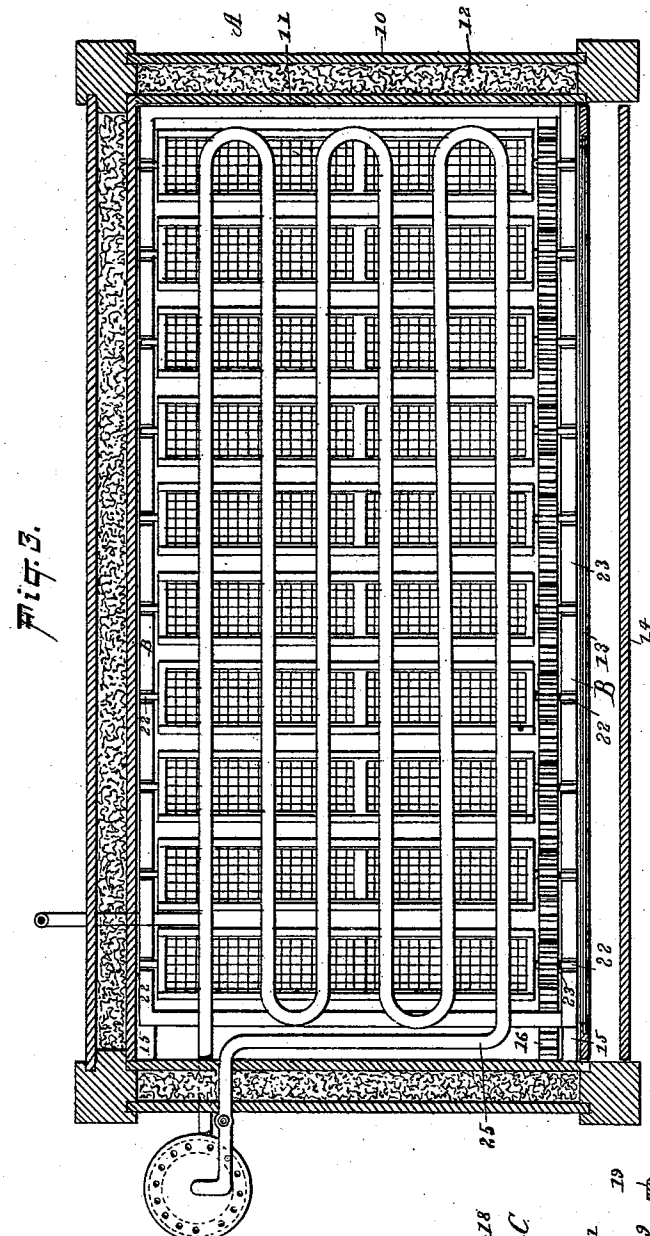

Fig. 3.

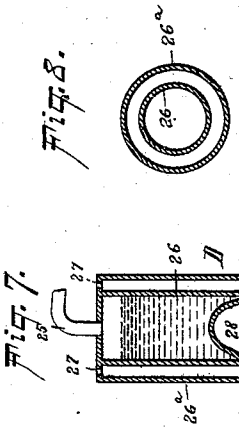

Fig. 8.

Fig. 7.

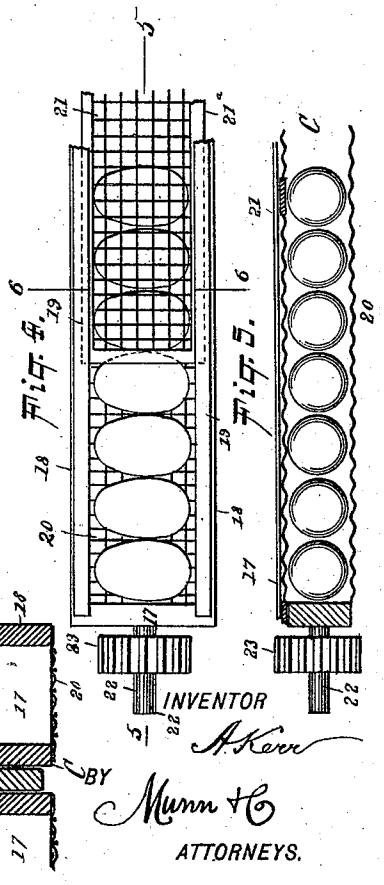

Fig. 4.

Fig. 5.

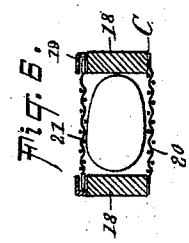

Fig. 6.

Fig. 6a.

WITNESSES:

William Gaebel.

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INVENTOR

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UNITED STATES PATENT OFFICE.

ARCHIBALD KERR, OF CARMICHAEL'S, PENNSYLVANIA.

INCUBATOR.

SPECIFICATION forming part of Letters Patent No. 532,278, dated January 8, 1895.

Application filed August 1, 1894. Serial No. 519,194. (No model.)

To all whom it may concern:

Be it known that I, ARCHIBALD KERR, of Carmichael's, in the county of Greene and State of Pennsylvania, have invented a new and Improved Incubator, of which the following is a full, clear, and exact description.

My invention relates to an improvement in incubators, and the object of the invention is to provide a simple, durable, and economic device, and a means whereby the eggs contained in the incubator may be bodily turned over, being manipulated from the outside of the machine.

Another object of the invention is to provide revoluble trays adapted to contain the eggs, which trays are perforated or reticulated at top and bottom, enabling the hot air to circulate freely through them, the trays being likewise provided with doors or removable sections in one of their sides.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal section through the incubator, one portion of the trays being shown in end view and the other portion in cross section. Fig. 2 is a transverse vertical section taken substantially on the line 2—2 of Fig. 1. Fig. 3 is a horizontal section, taken practically on the line 3—3 of Fig. 1. Fig. 4 is a plan view of one of the trays, illustrating the position of the eggs therein, and the cover partially removed. Fig. 5 is a longitudinal section through the tray, taken practically on the line 5—5 of Fig. 4. Fig. 6 is a transverse section through the tray, taken essentially on the line 6—6 of Fig. 4. Fig. 7 is a vertical section through the boiler of the heater. Fig. 8 is a transverse section through said heater; and Fig. 9 is a sectional view through two of the trays, illustrating a stop serving to prevent the trays from turning.

The body A of the incubator is of box-like construction, and is supported preferably by suitable legs. This box body is provided with an outer wall 10 and an inner wall 11, the space between the two walls containing a filling 12 of a non-heat-conducting material, and preferably in one side of the box body an inner door 13 is formed, provided with a glass panel, and likewise an outer door 14. Thus by opening the outer door 14 the interior of the box body is rendered visible without necessitating an escape of hot air therefrom.

Near the bottom of the box body, at each side, a horizontal slide-way or shelf 15 is formed; and preferably the rear shelf or slideway is provided with a depression in the upper portion of its inner edge, in which depression a toothed track or rack 16 is secured in any approved manner.

A frame B is held to slide upon the ways 15, and the said frame is of less length than the body in order that it may reciprocate laterally therein. This frame carries a series of trays C, the trays being located at a distance apart sufficient to permit the trays to revolve. Each tray preferably consists of solid end sections 17 and side sections 18, said sections being ordinarily made of wood; and upon the upper portion of the side sections slideways 19 are produced. The bottom of each tray is covered with a reticulated or perforated material, firmly secured to the frame of the trays, and the top of each tray is closed by one or more panels 21 of woven wire, or of any reticulated or perforated material; and when the panels are made of woven wire their sides and ends are stiffened by strengthening strips or bindings 21^a, as shown in Fig. 4, the bindings being adapted to slide in the ways 19 of the top portions of the trays.

The width of the trays is such as to neatly receive an egg when the egg is placed transversely in the tray, that is, with its ends facing the sides. Therefore, when the tray is revolved, only the ends of the eggs contact with the sides of the tray, and since eggs are strongest at their ends, they will not break or

suffer damage from the slight shock which they will receive as the tray is turned over.

At each end of the tray a trunnion 22 is secured, and upon one of the trunnions of each tray a pinion 23 is fastened in any approved manner, the said pinion being adapted to mesh with or travel upon the rack 16. The eggs having been placed in position in the trays, and the panels 21 being made to cover the trays, the eggs will be held between two comparatively open surfaces, and the heated air will have free access to every portion of the shells.

When it becomes necessary or desirable to bring what has been the bottom portion of the eggs uppermost, all the eggs are simultaneously turned by laterally reciprocating the frame B carrying the trays, which is ordinarily accomplished from the exterior of the box through the medium of the handle 24, extending from one end thereof, as shown in Fig. 1, and a slight movement of this handle inward or outward will suffice to cause all of the egg trays to make a complete revolution. After a certain time has elapsed, it is desirable to hold the trays stationary, and also to close the space between the trays to avoid an accident to the young chicks. This is readily accomplished by introducing the vertical member of a T-bar C′ into the space between each two opposing trays, the horizontal member of the said bar extending over the top portion of the trays, as illustrated in Fig. 9.

The heating is preferably accomplished through the medium of steam or hot water; and to that end a coil, or coils of pipe 25, are located in the box body over the nest of trays, as shown in Fig. 3. One end of this coil is introduced into the top of a heater D, the other end of the coil being introduced into the bottom portion of the said heater, in order that a thorough circulation may be accomplished.

The preferred heater is that which is shown in detail in Fig. 7, and consists of a cylinder 26, surrounded by a casing 26^a, which extends below its bottom, and the said casing is connected with the cylinder at the top, the connecting section having vent apertures 27 produced therein.

In order to obtain a maximum of heating surface, the lower end of the cylinder 26 is provided with a concavity 28 of greater or less extent. The heating agent is ordinarily a lamp 29, which delivers its heat upon the concaved surface 28.

A vent pipe 30, is located in the upper return of the coil, and extends upward beyond the top of a reservoir 31, adapted to hold cold water and connected with the coil by means of a branch pipe 32; and in this manner the water in the boiler is constantly supplied and the circulation is made substantially perfect, since the air can escape through the vent 30.

The eggs should be elevated a little at their small ends, so that in the event of an excess of moisture the chicks will not be smothered by the fluid in the eggs.

The egg trays can be lifted out one at a time without removing the tray drawer, which is a great advantage in testing fertility of the eggs, as the eggs would become chilled if it were necessary to keep the drawer out until all the eggs were tested.

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

1. In an incubator, a revoluble tray adapted to receive eggs fitting snugly therein, and means for revolving the tray, whereby provision is made for bodily turning the eggs over, as set forth.

2. In an incubator, a revoluble tray adapted to receive eggs fitting snugly therein, and provided with ventilating surfaces, and means for revolving the tray, whereby provision is made for bodily turning the eggs over and allowing the hot air to circulate freely around the eggs, as specified.

3. In an incubator, a revoluble tray having opposite surfaces constructed of a ventilating material, the material of one surface being removable, the tray being adapted to receive eggs fitting snugly therein, and means for revolving the tray, whereby provision is made for readily inserting the eggs in the tray, bodily turning the eggs over, and allowing the hot air to circulate freely around the eggs, as set forth.

4. In an incubator, a tray adapted to receive eggs and mounted to turn, the tray being of a width corresponding substantially to the length of an egg, the eggs being placed transversely in the tray, the said tray being further provided with one surface constructed of a reticulated or perforated material and securely attached to the frame of the tray, the opposite surface being removable and means for revolving the tray, as and for the purpose specified.

5. In an incubator, a frame or drawer adapted to be located in a hatching chamber, a series of revoluble trays mounted in said drawer, said trays being adapted to receive eggs fitting snugly therein, and means for revolving the trays, substantially as described.

6. In an incubator, an egg tray having solid ends and sides and reticulated or perforated top and bottom, the top being removable, and provided with trunnions at its ends, said tray being adapted to receive eggs fitting snugly therein substantially as described.

7. In an incubator, the combination with a frame or drawer a fixed rack and means for shifting the frame, of trays mounted to turn in said frame and having ventilating surfaces and a removable cover, the said trays having also a pinion located upon one of their trunnions for engagement with the fixed rack, as and for the purpose specified.

8. In an incubator, the combination, with a chamber provided with slide-ways, a rack, and a frame having movement upon said ways, and means for shifting the frame, of trays mounted to turn in said frame and having ventilating surfaces and a removable cover, the said trays each having also a pinion located upon one of their trunnions for engagement with the said rack, and a stop bar adapted to be entered between opposing trays, as and for the purpose specified.

ARCHIBALD KERR.

Witnesses:
THOMAS W. ROGERS,
JOHN L. HOPTON.