

No. 619,521.

Patented Feb. 14, 1899.

C. VON CULIN.  
INCUBATOR.

(Application filed July 5, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

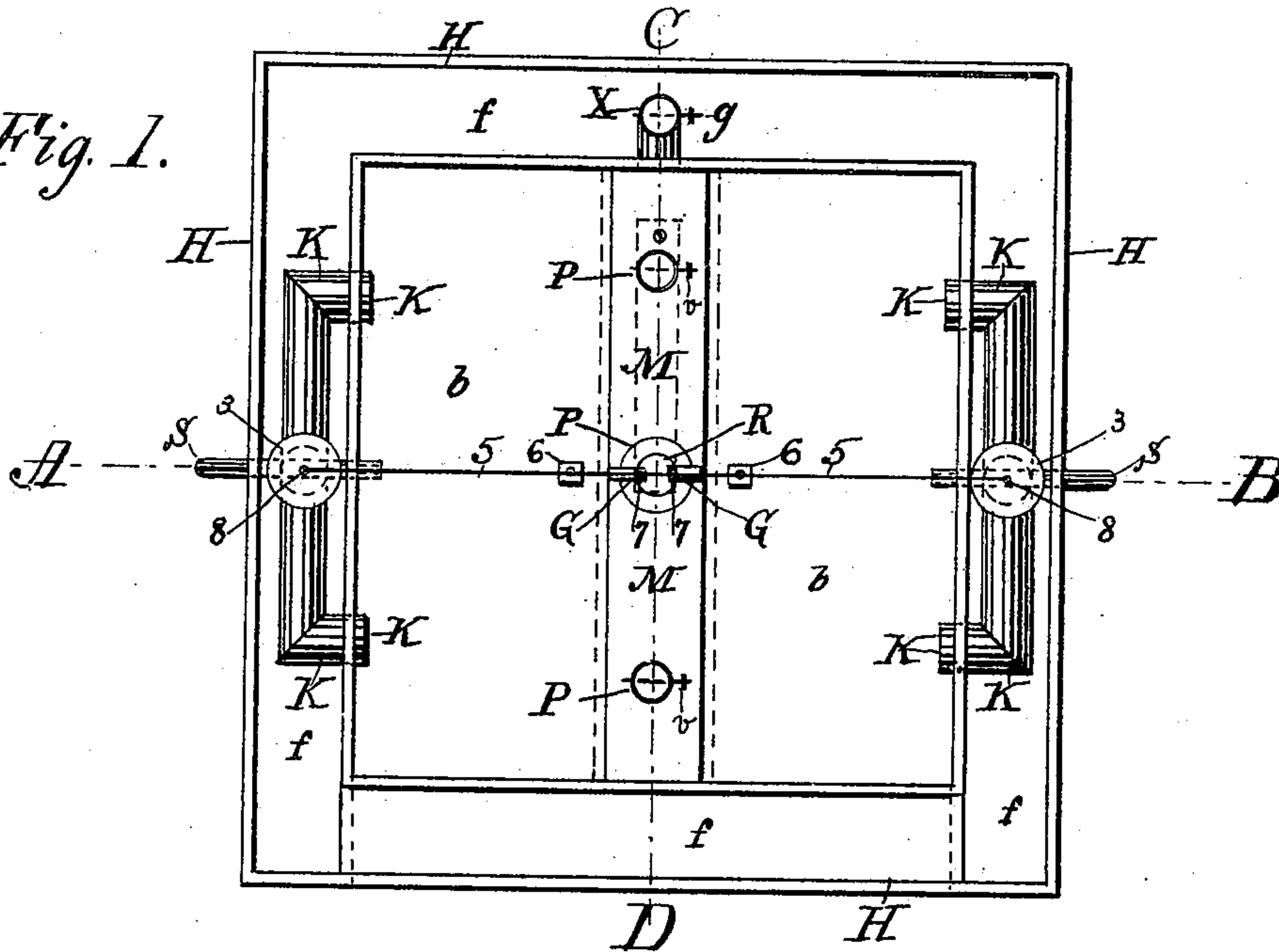
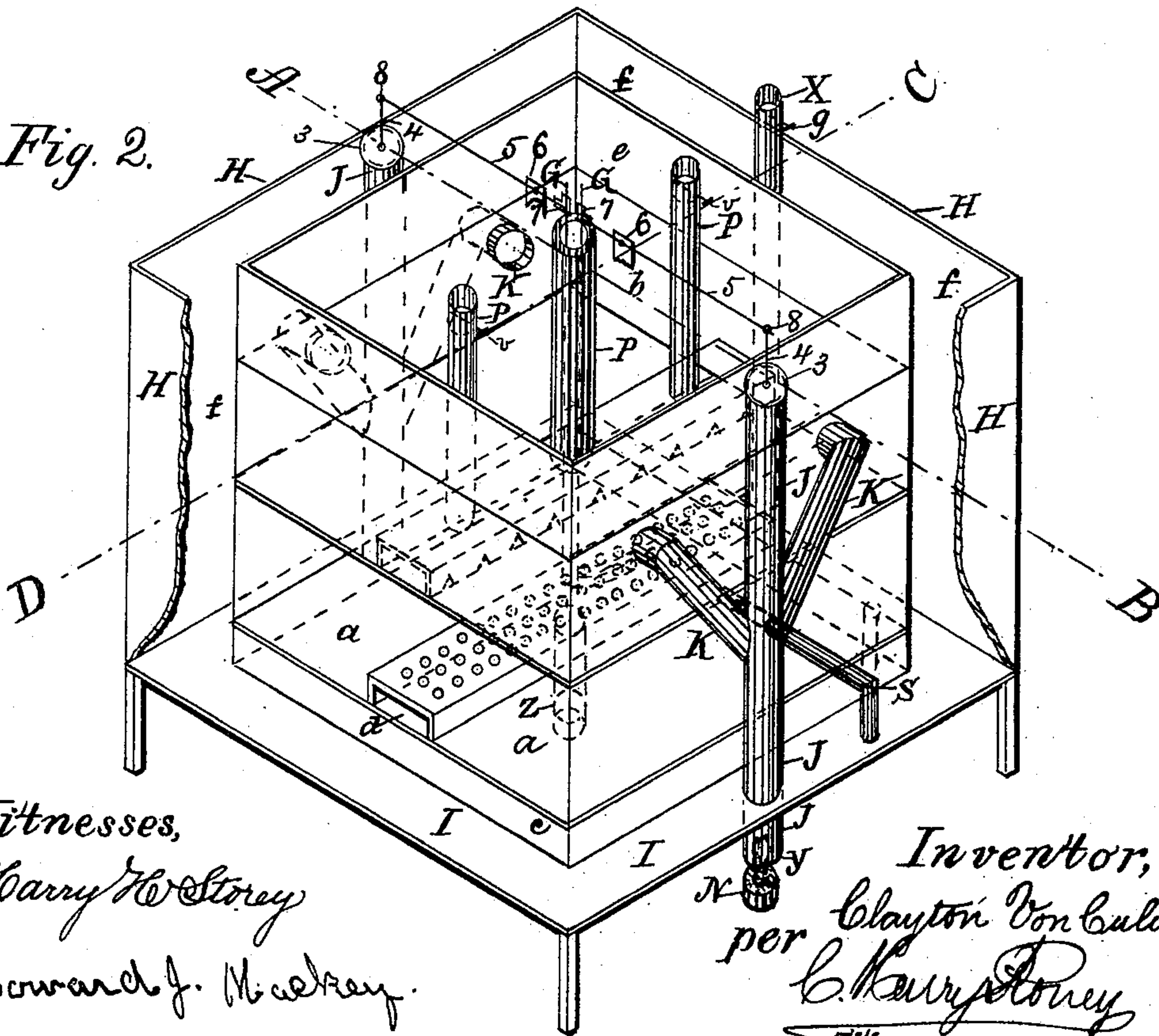


Fig. 2.



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Inventor,  
Clayton Von Culin,  
per C. H. Storey  
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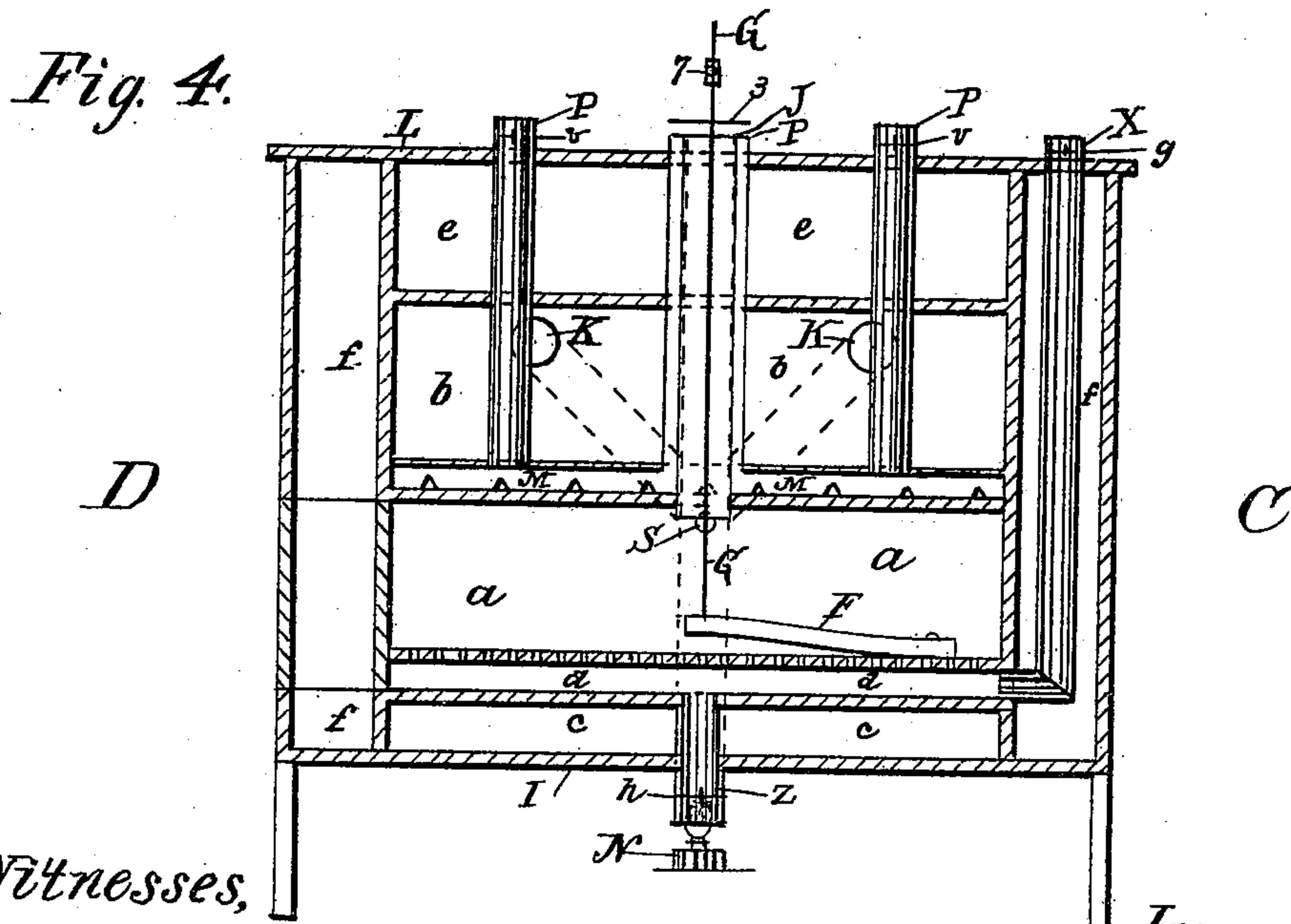
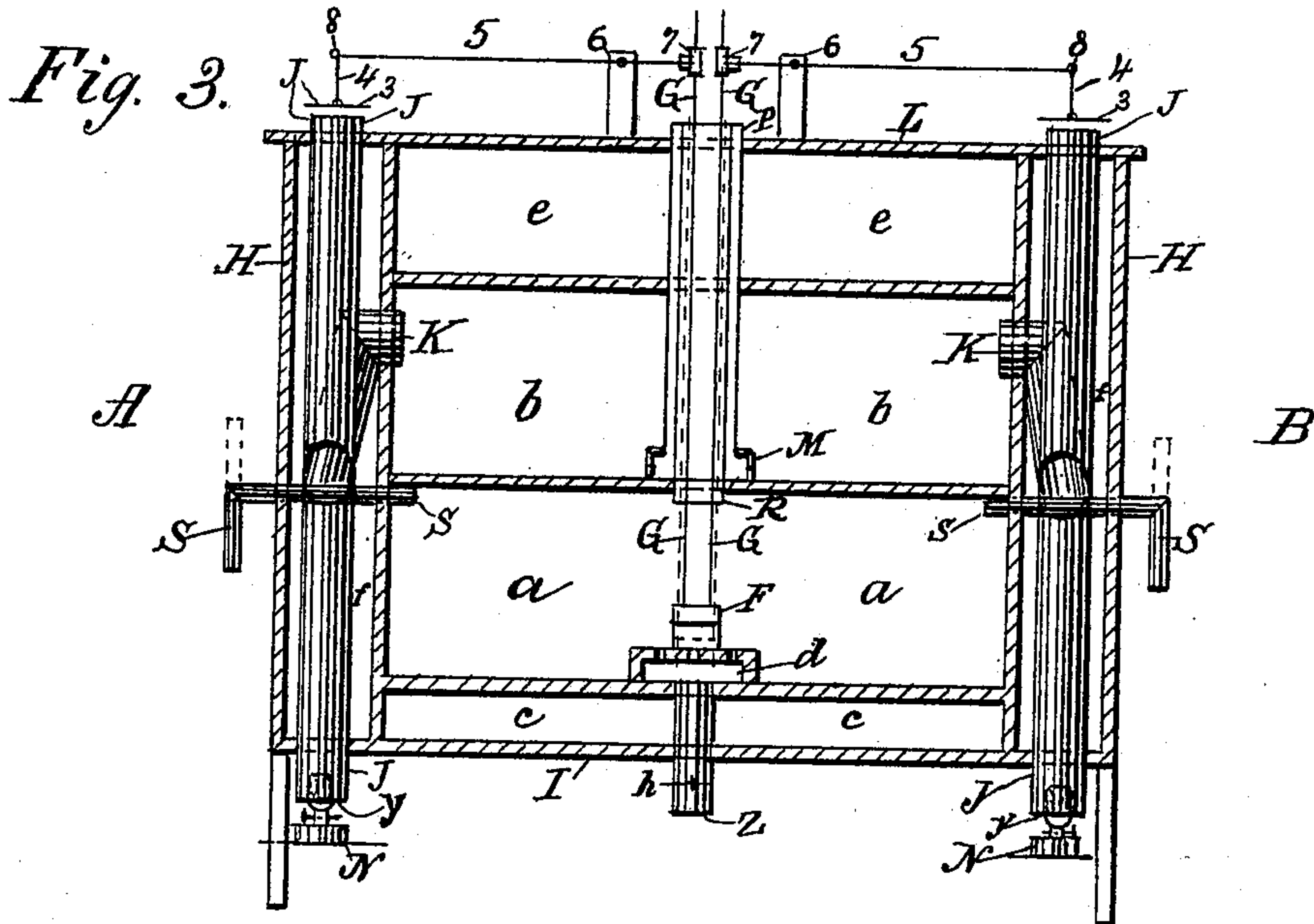
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Witnesses,  
Harry H. Storey  
Howard J. Mackey.

Inventor,  
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# UNITED STATES PATENT OFFICE.

CLAYTON VON CULIN, OF DELAWARE CITY, DELAWARE.

## INCUBATOR.

SPECIFICATION forming part of Letters Patent No. 619,521, dated February 14, 1899.

Application filed July 5, 1898. Serial No. 685,155. (No model.)

*To all whom it may concern:*

Be it known that I, CLAYTON VON CULIN, a citizen of the United States of America, and a resident of Delaware City, county of New Castle, and State of Delaware, have invented certain new and useful Improvements in Incubators, of which the following is a specification.

My invention relates to improvements in incubators; and the novelty consists in the combination of the several parts as a whole in which the temperature of the apparatus is controlled so that a uniform temperature may be maintained in all parts of the egg-chamber and less oil or other fuel be required to heat it properly than has heretofore been required for this purpose. At the same time my improvements enable the egg or incubating chamber to be thoroughly ventilated, warm or cool air, admitted as desired, passing over every egg, making it practicable to hatch all kinds of eggs in any location, climate, or altitude, as my improvements insure equally good hatches from chicken, duck, turkey, goose, or ostrich eggs. I attain these objects by the mechanism shown in the accompanying drawings, in which similar reference letters and numbers indicate similar parts in all the figures.

Figure 1 shows a plan view of my apparatus with the top removed. Fig. 2 shows a view of Fig. 1 in isometrical perspective, with part of end and one side removed to show the interior construction. Fig. 3 shows a vertical longitudinal view on line A B of Fig. 1. Fig. 4 shows a transverse vertical sectional view on line C D of Fig. 1.

The principal parts of my apparatus are the egg incubating or hatching chamber *a*; hot-air chamber *b*; inlet-openings *y y* for air in the hot-air pipes J J and K K, leading into the hot-air chamber *b*, the air being heated by lamps or other suitable means as it passes into the pipes or conductors J J and K K; a thermostat F, with its rods G G, 5 5, and 4 4 to operate the dampers 3 3 to open and close the upper ends of the hot-air conductors J J; a perforated tube M in the bottom of the heat or hot-air chamber *b*, having draft-pipes P P P, with their valves *v v v*; warm-air ventilating-pipes S S, passing through the hot-

air pipes J J into the top of the egg-chamber *a*, and a perforated ventilating-tube (supporting the thermostat F) on the bottom of the egg-chamber *a* and having a ventilating flue or tube X, passing out through the top of the incubator and fitted with a valve capable of being opened or closed, the said perforated tube *d* also having an inlet-pipe Z (fitted with a valve) and extending down through the bottom I of the incubator. The thermostat rods G G pass up through a tube R, annularly placed in the central draft-tube P. The egg-chamber *a* and hot-air chamber *b* are surrounded by air-spaces *c*, *e*, *f f f*, and *f*, which may be packed with non-conducting materials inclosed in the outer case H H H H, with bottom I and cover L, containing the tubes J J, K K, X, Z. The egg-chamber *a* and outer case have suitable openings for the introduction of the eggs and the removal of the hatched birds.

My invention is operated as follows: After adjusting the thermostat F to the temperature at which the egg-chamber *a* is to be maintained the eggs desired to be hatched are placed in the egg-chamber *a*. The lighted lamps N N are placed in the lower ends of the heated-air conductors J J, the dampers 3 3 being closed. The current of heated air from the lamps passes up through the inclined pipes K K into the hot-air chamber *b*, and from thence through the perforated pipe M and draft-pipes P P P to the external air. At the same time the tubes S S are turned so that their outer ends are turned down, permitting the entrance of warmed air to the egg-chamber *a*, as the tubes S S pass through the hot-air pipes J J, which heat the pipes S S and the air passing through them into the egg-chamber *a*. This air then passes from the egg-chamber *a* through the perforated tube *d* and ventilating-tube X to the external air. When the temperature of the egg-chamber *a* reaches the desired degree, the thermostat F draws down the rods G G, thus actuating the levers 5 5 and rods 4 4 to raise the dampers or valves 3 3, closing the hot-air conductors J J, permitting part or all of the hot air in said conductors J J to escape at their upper ends instead of passing through the inclined pipes K K into the hot-air cham-



ber *b*. When the temperature falls below the desired degree in the egg-chamber *a*, the thermostat *F* reverses its above-described action by raising the rods *G G*, actuating the  
 5 levers *5 5* and rods *4 4* and dropping the dampers *3 3*, partly or entirely closing the hot-air pipes *J J*, and again turns some or all of the heated air through the inclined pipes *K K* into the hot-air chamber *b*. This process continues automatically as long as de-  
 10 sired while the lamps are lighted, thus maintaining a uniform temperature in the egg-chamber *a*.

The quantity of warmed air admitted to the  
 15 egg-chamber *a* through the tubes *S S* may be varied, as one or both of them may have their outer ends turned up, as shown by the dotted lines, when their action will be reversed from that above described and the  
 20 warm air will pass out through them from the egg-chamber *a* to the external air. The quantity of air passing through the egg-chamber *a* may also be varied by the valves in the pipes *X* and *Z*.

25 The rods *G G*, levers *5 5*, and rods *4 4* may be flexibly connected at *7 7* and *8 8* and supported by suitable fulcrums *6 6*. I have shown the pipes *K K K K* running diagonally upward from each side of the hot-air con-  
 30 ductors *J J*, thus losing less heat by radiation in the non-conducting space than if the pipes *K K K K* are run horizontally, and also obviating the danger of overheating that portion of the apparatus. I also by arranging  
 35 the pipes *K K* with their discharge-openings as shown enable the heated air to be more equally distributed in the hot-air chamber *b* than by passing the air in at one point only.

40 I have shown an incubator having two sets of lamps and hot-air conductors *J J*, each having two inclined hot-air pipes *K K*; but in a small incubator I may use only one lamp and

one heated-air conductor *J*, with its two inclined pipes *K K*.

What I claim, and desire to secure by Let- 45  
 ters Patent of the United States, is—

An incubator consisting of a hatching-chamber and a hot-air or heating chamber; a main conductor having an inlet at its lower end and an outlet at its upper end, said outlet 50  
 having a valve adapted to open or close the said outlet; a thermostat in the hatching-chamber, said thermostat being connected with said outlet-valve and adapted to open or close said valve; two inclined hot-air con- 55  
 ductors from each main conductor entering the heating-chamber about one-fourth of the distance from each end of said heating-chamber; a perforated tube in the middle of the bottom of said heating-chamber and extend- 60  
 ing its entire length with two outlet draft-tubes leading from said perforated tube to the top of the incubator; a perforated tube in the middle of the bottom of the hatching- 65  
 chamber directly under the thermostat and having an outlet extending through the bot-  
 tom of the incubator and having a valve adapted to open or close, said perforated pipe also having another outlet extending back and up through the top of the incubator and 70  
 having a valve adapted to open or close; a tube passing through each main conductor from the exterior of the incubator into the upper part of the hatching-chamber, each of  
 75 said tubes having an elbow adapted to be turned up or down on its exterior end, all substantially as shown and for the purposes set forth.

Signed by me at Philadelphia, Pennsylvania, this 21st day of June, 1898.

CLAYTON VON CULIN.

Witnesses:

CHARLES HENRY RONEY,  
 CHAS. P. ROONEY.