(No Model.)

E. P. ALEXANDER.

HEATER FOR INCUBATORS.

No. 502,899. Patented Aug. 8, 1893.

Fig. 1.

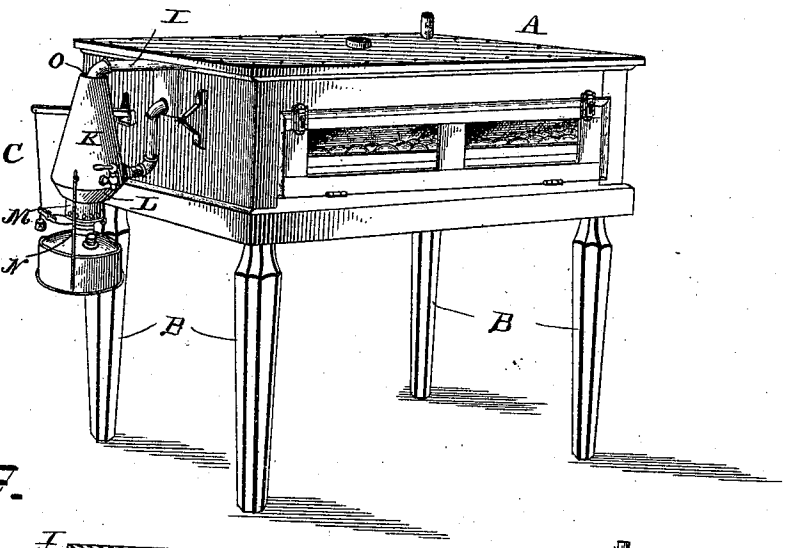


Fig. 2.

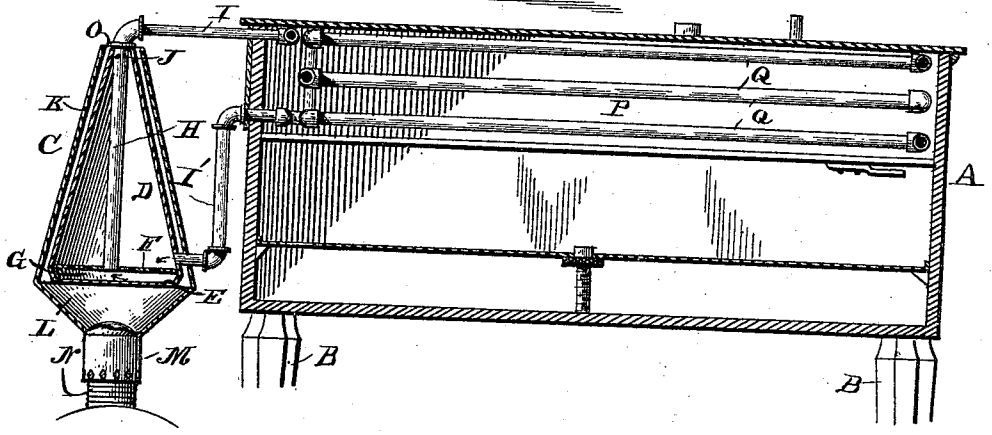
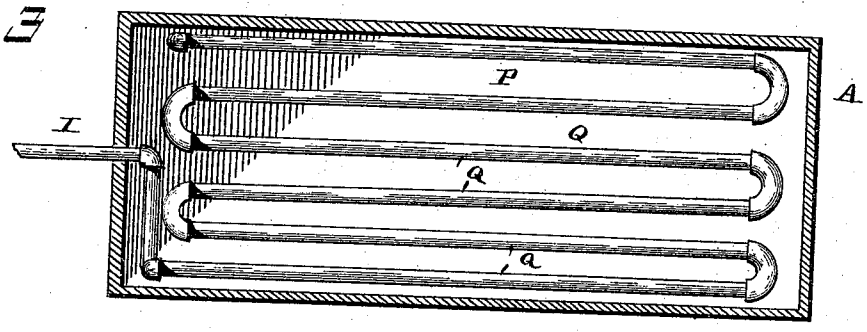


Fig. 3.



Witnesses
W. C. Schneider
D. P. Wolhaupter.

Inventor
E. P. Alexander.

By his Attorneys,
C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

ELMER P. ALEXANDER, OF YEAGERTOWN, PENNSYLVANIA.

HEATER FOR INCUBATORS.

SPECIFICATION forming part of Letters Patent No. 502,899, dated August 8, 1893.

Application filed December 31, 1892. Serial No. 456,911. (No model.)

To all whom it may concern:

Be it known that I, ELMER P. ALEXANDER, a citizen of the United States, residing at Yeagertown, in the county of Mifflin and State of Pennsylvania, have invented a new and useful Improvement in Heaters for Incubators, of which the following is a specification.

This invention relates to heaters for incubators; and it has for its object to provide certain improvements in devices of this character, whereby efficient means shall be provided for maintaining a uniform and equally distributed heat throughout the entire incubating chamber.

With these and other objects in view which will readily appear as the nature of the invention is understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a perspective view of an incubator having a heater connected therewith, and constructed in accordance with this invention. Fig. 2 is a central longitudinal sectional view thereof. Fig. 3 is a detail plan view of the upper coil of pipes of the incubator heat radiator.

Referring to the accompanying drawings, A represents an incubator casing constructed in any approved manner, and supported on the usual legs B. The incubator casing A, receives the ordinary egg drawers and has arranged at one end thereof the heater C. The heater C is provided with an inclosed conical water chamber D. The conical water chamber D, has the lower closed base E, directly above which, and inside of the chamber is arranged the supplemental perforated bottom F, which forms therebetween and the closed base a hot water space G, from which the heated water circulates up through the vertical heater tube H. The heater tube H, has its lower end passed centrally through the perforated supplemental bottom F, and communicates with the hot water space G, at the bottom of the water chamber. The upper end of said tube meets the apex of the chamber D, in a closed joint, and is provided near such upper end with the circulating openings J, which communicate with the interior of the water chamber D, so that water which has risen up to the apex thereof can find a passage into the vertical tube H, and thence through the upper circulating pipe I, connected therewith. The entire water chamber D, is inclosed by a larger conical heat jacket K. The enlarged conical heat jacket K, entirely incloses the chamber D, from the base to the apex thereof, and is provided below the base of the water chamber with a downwardly tapered base portion L, terminating in a neck M, which receives the burner of a suitable lamp N, said jacket K, being open at its apex at O, to allow the smoke and other products of combustion to escape. Now by reason of having the water inclosed in a surrounding heat jacket of the same conical shape, every exterior portion of the water chamber is a heating surface, and as the heat rises from the flame of the lamp, it not only comes into direct contact with the closed base or imperforate bottom E, of the water chamber, but it also surrounds the entire cone chamber D, so as to leave no portion thereof exposed to the cooling air of the outside atmosphere. The hot water which circulates through the vertical heater tube H, passes through the upper circulating pipe or tube I, into the heat radiator P, arranged within the top portion of the incubator casing A. The heat radiator P, is suitably supported within the incubator casing and comprises a parallel series of horizontal connected water coils Q, each of which consists of a series of horizontal pipes *q* connected at their ends by return bends. The upper pipe I, connects with the uppermost coil of the radiator so that the hot water necessarily passes through every coil and pipe of the radiator until, in its cooled condition, it finds escape through the lower circulating return pipe I′. The pipe I′, pierces the jacket K, and connects with the interior of the water chamber D, above the inner perforated bottom F. It will be observed that as the cooled water enters the water chamber D, above its perforated bottom, such water will not at once mingle directly with the heated water passing into the pipe I, but will first pass down through the perforations in the bottom F, and into the space G, where it receives the direct heat from the bottom E, which lies directly over the lamp burner. The heated water now circulates up through the tube H, and again starts on its circuit, it being seen that

owing to the conical shape of the water chamber D, a certain amount of water necessarily rises to the apex of the chamber and finds escape into the circulating tube I, through the openings J, near the upper end of the tube H.

From the foregoing it will be seen that not only is an efficient heater provided, but in connection therewith a radiator which by reason of the arrangement of its coils provides means for equally and uniformly distributing heat to every portion of the incubator casing.

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 this invention.

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

1. The combination in an incubator, of the parallel series of the horizontal connected water coils arranged one above the other within said incubator, the adjacent heater having an inner conical water chamber provided with separate communicating water spaces, and an outer inclosing conical heat jacket, and water circulating pipes connected with the separate water spaces of the heater and with the upper and lowermost heating coils, respectively, substantially as set forth.

2. The combination in an incubator, of a heater comprising an inner conical water chamber having a bottom hot water space, a vertical heater tube connected with said hot water space and passing through the top of said water chamber, a larger conical heat jacket surrounding the entire conical water chamber, and hot water circulating pipes, substantially as set forth.

3. A heater comprising a conical water chamber having a closed base, a supplemental perforated bottom arranged within the water chamber above the closed base, a vertical heater tube connected at its lower end to the perforated bottom and meeting the apex of the water chamber in a closed joint, said tube being provided with perforations near its upper end, a larger conical heat jacket entirely surrounding the conical water chamber and provided with a downwardly tapered base portion terminating in a neck to receive the burner of a lamp, and hot water circulating pipes connected with the upper end of the vertical heater tube and with the water chamber directly over the perforated bottom therein, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ELMER P. ALEXANDER.

Witnesses:
WALTER S. KEARNS,
SAMUEL STEINBARGER.