

989,881.

This technical drawing shows a cross-section of a mechanical assembly. At the base is a pedestal (1) with vertical slots, supporting a cylindrical component (2) with a flange (2'). Above this is a larger cylindrical housing (3) containing internal parts (10, 22). A central conical structure (20) is suspended within the housing. The conical structure has a dashed centerline (7) and is surrounded by a material with horizontal hatching (8). The housing has a thick wall (5) and a flange (6) with a curved profile (9). A horizontal rod (35) is at the top, connected to a vertical rod (15) that passes through a cap (16) and a seal (14). The cap is secured by a nut (17) and a washer (37). A horizontal plate (30) is also visible on the left side. Various other parts are labeled with numbers: 4, 12, 13, 31, 32, 36, and 38.

W. H. C. Clarke,

Orlando P. Shoemaker Inventor,
by *C. A. Snow & Co.*
Attorneys.

UNITED STATES PATENT OFFICE.

ORLANDO P. SHOEMAKER, OF CLAY CENTER, NEBRASKA.

HEATER FOR INCUBATORS.

989,881.

Specification of Letters Patent. Patented Apr. 18, 1911.

Application filed May 7, 1910. Serial No. 560,084.

To all whom it may concern:

Be it known that I, ORLANDO P. SHOEMAKER, a citizen of the United States, residing at Clay Center, in the county of Clay and State of Nebraska, have invented a new and useful Heater for Incubators, of which the following is a specification.

This invention relates generally to incubators and more particularly to means for heating the same.

The object of the invention is to provide a heater for incubators which is strong, simple, durable and comparatively inexpensive in construction as well as thoroughly efficient and practical in operation and is arranged in such manner as to eliminate the likelihood of burning out the fittings.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of the claim without departing from the spirit of the invention.

In the accompanying drawings forming a part of this specification, the figure is a vertical section through an incubator heater constructed in accordance with the present invention.

The reference numeral 1 indicates a portion of the lamp casing and 2' the chimney thereof. Extending upward from the lamp 1 is a circular casing 2 which at its upper end is extended outward as indicated at 3 and upward as indicated at 4 to produce an enlarged hot air casing. Telescoping downward into the upper end of the hot air casing 4 is a cover member 5 which is slightly smaller in dimension than the casing 4 so as to produce the outlet openings 6 for the escape of the heated air after it has performed its proper function. The cover member 5 preferably rests upon a plurality of bracket members 7 which extend outward from the walls of the water chamber 8 and are provided with shoulder portions 9 to receive the lower edges of the cover member 5.

The water chamber 8 which preferably is circular in shape, rests at its lower end upon supporting brackets 10 which are connected with the hot air casing 4. The water chamber 8 is formed through the center thereof with a frusto-conical flue 12 which is open

at its upper end as indicated at 13, the opening 13 being normally closed by means of a thermostatically controlled cover plate or valve 14. The valve 14 is connected by a stem 15 with a larger valve 16 which normally closes the flanged opening 17 formed in the upper end of the cover member 5 above the opening 13 through the annular water chamber 8.

Mounted within the frusto-conical flue 12 in the water heater 8 is a frusto-conical shield member 20 which is spaced away from the adjacent inner walls 12 of the water heater to produce an annular hot air passage 21. The frusto-conical baffle member 20 is supported upon brackets 22 connected with the lower ends of the water chamber 8 as shown. The lamp chimney 2 extends upward concentrically within the frusto-conical shield member 20 and is separated a slight distance therefrom.

The annular water heater 8 is provided at one point with an outlet pipe 30 which extends through the cover member 5 of the hot air chamber. The return inlet from the incubator to the hot water heater is indicated by the reference numeral 31. The pipe 31 extends through the cover member 5 and communicates with the water heater 8. Upon the interior of the water heater 8, adjacent the inlet 31, a downwardly extending baffle 32 is provided, the function of said baffle 32 being to direct the cold or non-heated water entering the pipe 31 downward to the lower end of the water heater 8. The baffle 32 thus prevents the incoming stream of non-heated water from interfering with the outgoing stream of heated water. The stem 15 of the cover plates or valves 14 and 16 is supported upon an arm 35 which is connected in any suitable manner with the thermostat located within the incubator so as to cause the valves 14 and 16 to be controlled by the fluctuations in temperature within the egg chamber.

Constructed as described, the operation of the device is approximately as follows: The hot air from the lamp 1 rises through the frusto-conical shield member 20. When the valves 14 and 15 are closed, the hot air then passes downward through the frusto-conical passage 21 to the lower end of the water heater 8. The stream of air then passes upward on the outside of the water heater 8 in the hot air chamber 36. The air from the chamber 36 penetrates entirely upward

to the space 37 between the upper end of the water heater and the upper end of the cover member 5. The excess of heated air passes outward through the passage 6. The
 5 heated air in its passage around the water heater 8 serves to heat the water therein to a sufficient temperature to cause it to flow to the incubator and to maintain the same at the proper temperature. The frusto-conical
 10 means 12 in the water heater 8 serves to produce thin lower portions on said water heater and as the cold water collects at this point, the heat which is radiated thereinto by the hot air in the adjoining passages,
 15 readily heats the same without the expenditure of much energy. The frusto-conical shield member 20 serves to protect the inner walls of the water heater from the effects of the direct rays of heat and thus prolongs
 20 the life thereof materially. Furthermore the frusto-conical shield member 20 serves to prevent the deposit of soot upon the inner walls 12 of the water heater and the efficiency of the water heater is thus mate-
 25 rially increased, as a coating of soot thereon would prevent the penetration of the heat and would materially decrease the efficiency of the apparatus.

When the heat in the incubator reaches
 30 too high a degree of temperature and the valves 14 and 15 are thermostatically operated, the hot air passes from the lamp chimney directly through the frusto-conical shield member 20 and outward through the
 35 openings 13 and 17. By reason of the fact that the shield member 20 serves to protect the water heater from the direct effects of the heat, the temperature of the water in the

heater soon drops sufficiently to restore the incubator to the normal temperature. 40

The heater of the present invention is strong, simple, durable and inexpensive in construction as well as thoroughly practical and efficient in operation.

What is claimed as new is:— 45

An incubator heater comprising a heating device, a frusto-conical shield surrounding the heating device, an annular water tank surrounding the shield and having a frusto-conical flue therethrough, the inner
 50 walls of the water tank being separated from the shield so as to provide an annular air passage therebetween, a valve mounted at the upper end of the frusto-conical flue through the water tank, a casing surround-
 55 ing the water tank and providing an air space on the outside thereof, the top of said casing being open, a cover member projecting downward into the upper end of the casing
 60 so as to provide an air discharge opening, brackets mounted on the water tank for supporting said cover member, there being an outlet formed in the upper end of said cover member, and a valve for said outlet con-
 65 nected with the valve at the upper end of the frusto-conical flue in the water tank, both of said valves being adapted to be thermostatically operated.

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

ORLANDO P. SHOEMAKER.

Witnesses:

F. A. THOMPSON,

H. A. SWANSON.