F. W. MILLS.

INCUBATOR.

APPLICATION FILED NOV. 17, 1915.

1,218,293.

Patented Mar. 6, 1917.

2 SHEETS—SHEET 1.

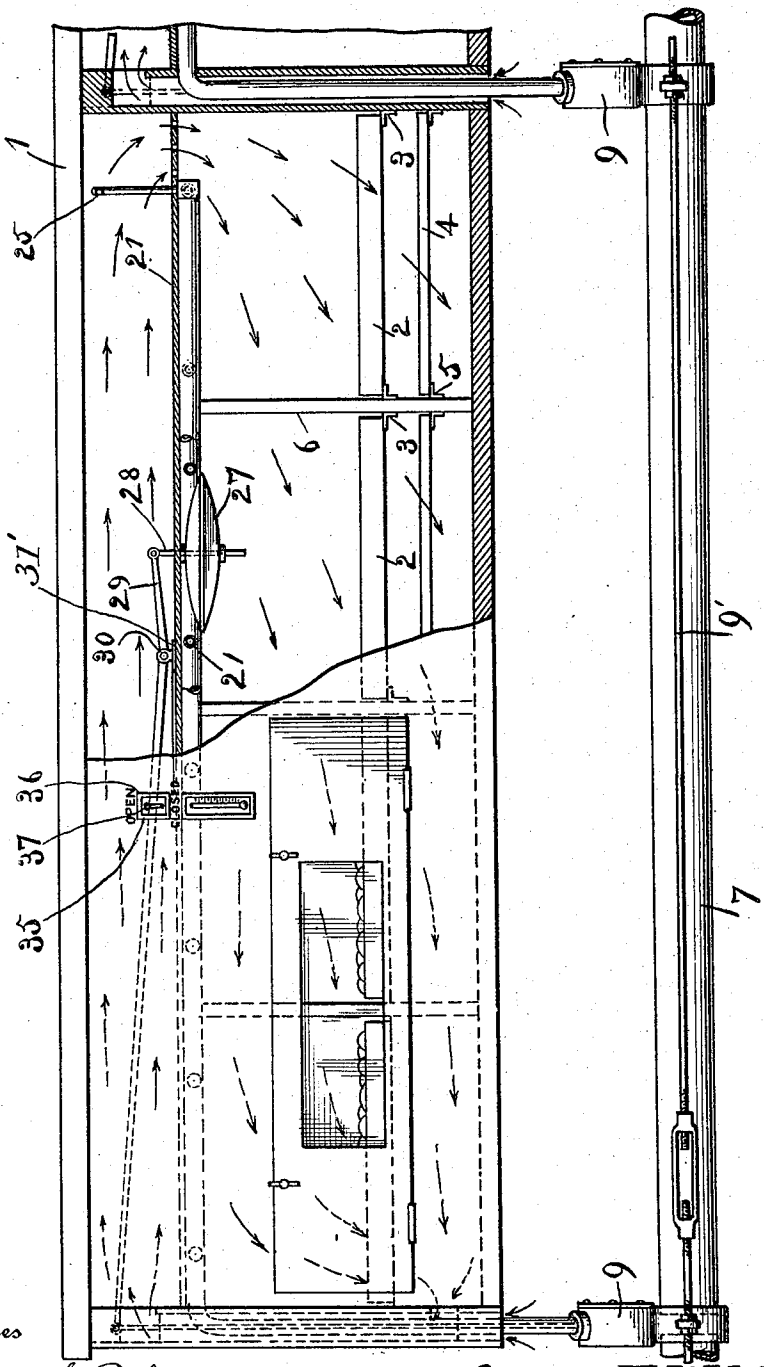

Fig. 1.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

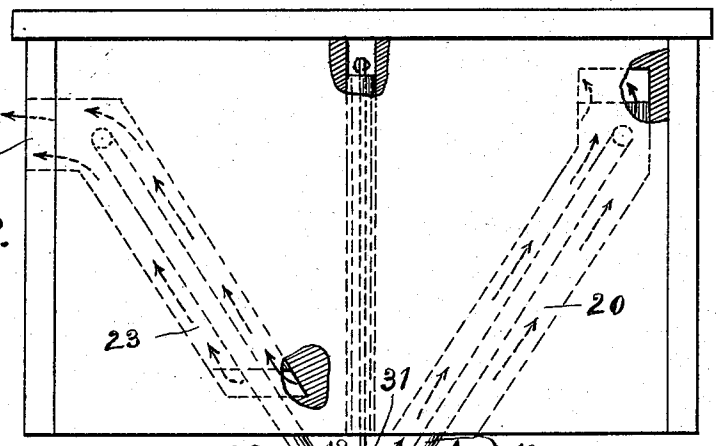
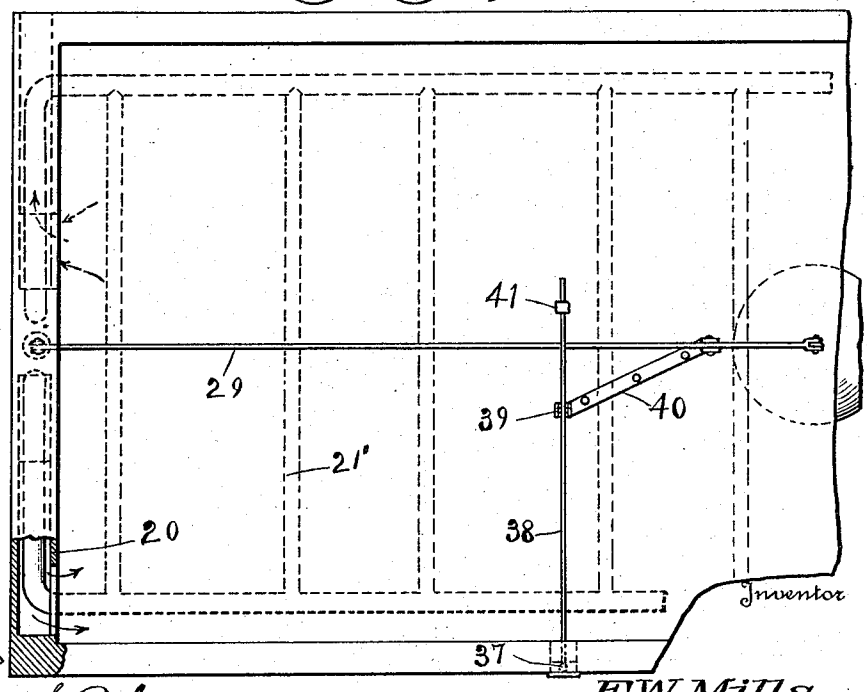


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANK WARD MILLS, OF LITTLE FALLS, NEW YORK.

INCUBATOR.

1,218,293. Specification of Letters Patent. Patented Mar. 6, 1917.

Application filed November 17, 1915. Serial No. 61,961.

To all whom it may concern:

Be it known that I, FRANK W. MILLS, a citizen of the United States, residing at Little Falls, in the county of Herkimer and State of New York, have invented certain new and useful Improvements in Incubators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in incubators and thermostatically-operated means for controlling the heating of the same.

More specifically, the invention consists of an incubator made of any suitable material, preferably of steel, and in sections, the individual compartments being provided with separate automatic heat controlling means communicating with a line pipe through which a fluid from a boiler is adapted to course, the incubators being so arranged that air will be forced in at the top of the machine by passing in contact with pipes through which the heated elements circulate, the chambers being provided with suitable ventilating means.

My invention comprises various other details of construction, combinations and arrangements of parts which will be hereinafter fully described, shown in the accompanying drawings and then specifically defined in the appended claims.

I illustrate my invention in the accompanying drawings, in which:

Figure 1 is a side elevation, the incubator being shown partly in vertical section.

Fig. 2 is a sectional view through the valve mechanism, the incubator being shown in end elevation, and

Fig. 3 is a top plan view of a part of the incubator, parts being in section.

Reference now being had to the details of the drawings by numeral, 1 designates one of the incubators, it being understood that any number of similar construction may be provided, each complete as to its own heating apparatus. Egg trays 2 are positioned in the incubator, being held upon the brackets 3 a slight distance above the trays 4 adapted to contain sand, said trays 4 being supported upon bracket members 5 projecting from the supports 6, said trays 4 being provided for moisture.

Positioned underneath the incubators are the line pipes 7 and 8, and 9 designates a valve casing (there being one for each incubator), having two slots to receive said pipes 7 and 8, the pipe 7 having an opening 10 which communicates with a port 11 in the valve casing and which port in turn communicates with a chamber 14. Upon reference to Fig. 1 of the drawings, it will be noted that the valve casings are connected together by means of rods 9′, the ends of which pass through lugs 9″ upon the wall of the casing and upon which rods threaded nuts 9^a are provided to securely hold the casing in place. A similar opening 15 is formed in the pipe 8 and leads into the duct 16 which also communicates with the chamber 14. Said chamber has two ports 17 and 18 leading from the chamber 14 and a pipe 19 leads from the port 18 and passes through a flue 20 formed in the end of the incubator frame and thence extends laterally through the incubator directly underneath the transverse partition 21 positioned a short distance below the top or roof of the incubator. Said pipe has laterally branching pipes 21′ which communicate with a similar pipe 22 passing through the diagonally disposed flue 23, which latter communicates with an exit opening 24 in the wall of the chamber. Rising from and communicating with the horizontally disposed pipe is a safety vent pipe 25 through which any air which may accumulate within the pipe may make exit.

A thermostat, designated by numeral 27, is mounted in each incubator and a rod 28 rises from the thermostat and is pivotally connected to the short arm of a lever 29 pivotally mounted upon a pin 30 on a bracket member 31′ supported by the partition 21. The long arm of said lever 29 is pivotally connected to a rod 31, which at its lower end carries a plate 32 having two conical-shaped valves 33 controlling the ports 17 and 18 respectively. One of the valves which regulates the flow of the heating fluid entering the pipe 19 is adapted to close in the direction of the flow of the heating fluid and the more pressure against the valve the more strongly the same will be closed.

An indicator, designated by numeral 35, is shown in Fig. 1 of the drawings and consists of a frame having a vertical slot 36 through which the spherical-shaped end 37

of the rod 38 passes, said rod being pivotally mounted at 39 upon the fixed bracket member 40 and a weight 41 is mounted upon one end of the rod 38, the portion of the rod intermediate said weight and its pivotal point resting upon the long arm of the lever 29, being adapted to be tilted by the lever as the same is raised and lowered incident to the expansion and contraction of the thermostat. When the lever assumes the position shown in Fig. 1 of the drawings, the valve will be open and is at its lowest throw and the ball 37 at the end of the rod 38, tilting with the lever, will be positioned at the upper end of the indicator, designating the valve open and, when the lever is tilted by the thermostat at a certain degree of temperature, the rod 38 will be tilted by the lever 29 so that the ball 37 will indicate valve closed or be positioned at the lower end of the slot in the indicator.

In operation, hot water from any suitable source of supply and conducted through the pipe 7 passes through the port 10 into the chamber 14 and, rising from the most direct course, passes into the duct 18 and with which port 14 the pipe 19 communicates. The hot water thence passes through the pipe 19 and into the heating coil located in the top of the egg chamber. The water then makes exit through the pipe 22 and through the duct 17 which is inclined toward the duct 16, thus tending to deflect the return water through the chamber 14 and into the duct 16, whence it makes exit through the port 15 into the pipe 8, which is the most direct course for the water to take. When the heated water circulates through the pipes, the air in the flue 20 will be heated by the heated pipe 19 and cause a current of air in the direction of the arrow, shown in Fig. 2, the fresh air passing into the portion of the incubator chamber above the partition 21 and passing through perforations in said partition and return through the compartment of the casing in which the egg trays are mounted, thence passing through the exit flue 23 and to the atmosphere through the opening 24. When the temperature within the chamber becomes heated to a certain degree, sufficient to cause the thermostat to act, the lever connected to the latter will tilt upon its pivot and cause the valves to seat, thus completely stopping the circulation of the hot water, this only being possible when both valves are shut off.

What I claim to be new is:—

1. An incubator having an egg containing chamber with ventilating flues communicating between the egg containing chamber and the atmosphere, a valve casing having ports therein with heating pipes communicating therewith and through which the heating liquid is adapted to circulate, a heating circulating container positioned within the incubator and passing through said ventilating flues and communicating with said ports, and thermostatically-operated valves regulating the circulation of the heating fluid.

2. An incubator having compartments with a perforated partition between the same, egg trays in one compartment, said incubator being provided with ventilating flues, one of which communicates between the egg tray containing compartment and the atmosphere and the other between the latter and the other compartment of the incubator, a valve casing having ports therein with heating pipes communicating therewith and through which heating fluid is adapted to circulate, a heating circulating container positioned within the incubator and passing through said ventilating flues and communicating with said ports, and thermostatically-operated valves regulating the flow of heating fluid into the heat circulating container.

3. An incubator having an egg containing chamber with ventilating flues communicating between the egg containing chamber and the atmosphere, a valve casing having ports therein with heating pipes communicating therewith and through which the heating liquid is adapted to circulate, a heating circulating container positioned within the incubator and passing through said ventilating flues and communicating with said ports, and a thermostatically-operated valve regulating the circulation of the heating fluid and closing in a direction of the flow of the heating fluid.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

FRANK WARD MILLS.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."