

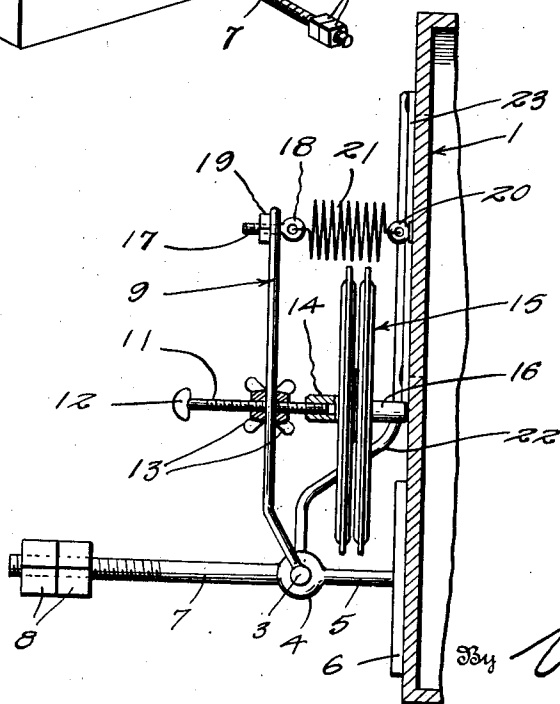
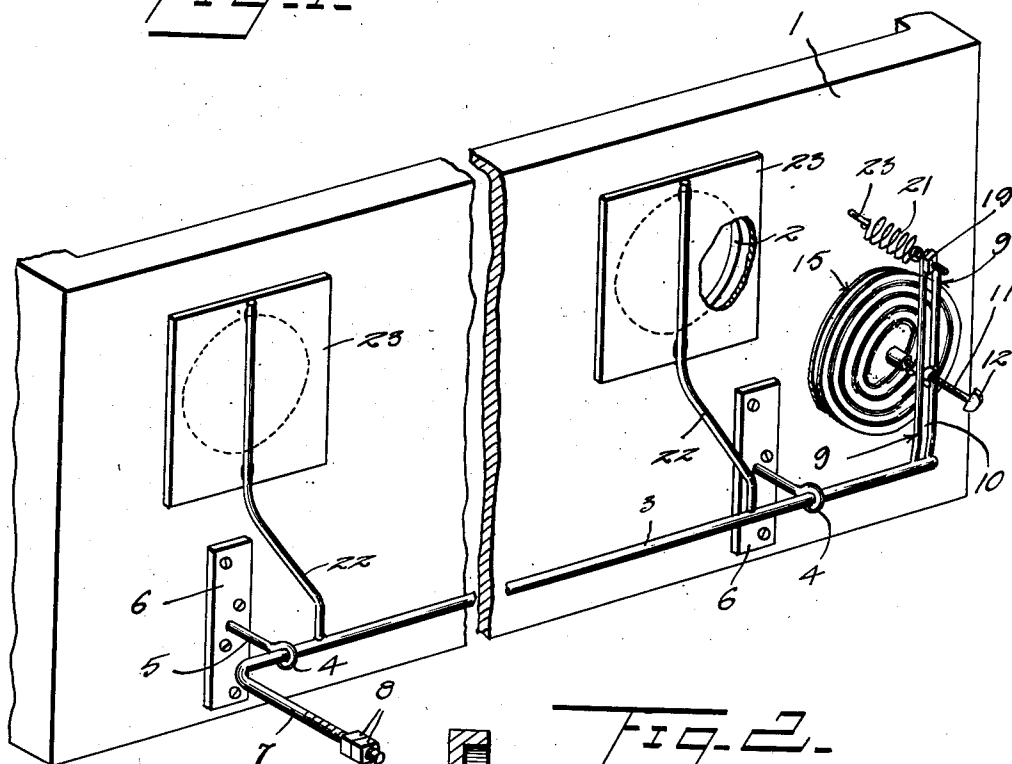
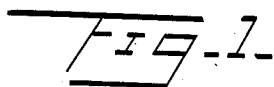
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AUTOMATIC AIR REGULATOR FOR INCUBATORS

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AUTOMATIC AIR REGULATOR FOR INCUBATORS

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6 Claims. (Cl. 236—49)

This invention relates to the class of animal husbandry and pertains particularly to improvements in incubators.

In incubators of the types now in use, provision is made for the introduction of air by means of apertures in a wall, which are controlled by hand-operated slide valves in the form of plates which may be moved across the air inlet openings and which have apertures therein which are brought into alinement with the air openings. The present invention has for its primary object to improve upon this method of controlling the supplying of air to the incubators by the provision of a thermostatically controlled valve plate whereby the air openings will be uncovered or covered, in accordance with the temperature of the room in which the incubator is placed.

Another object of the invention is to provide a novel means of controlling the admission of air into an incubator which comprises the mounting of a shaft upon the outside of the incubator structure, upon which shaft cover plates are carried for movement relative to air apertures in the wall of the incubator structure and with which shaft a temperature actuated thermostat wafer is connected so that the expansion and contraction of the wafer will effect the oscillation of the shaft for the movement of the cover plates toward or away from the air openings.

Still another object of the invention is to provide a device of the above described character which is readily adjusted so that the device can be made to operate at any desired room temperature.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

Figure 1 is a view in perspective of a portion of a wall of an incubator structure showing the device embodying the present invention applied to the exterior thereof.

Fig. 2 is a vertical sectional view through the wall and looking at one end of the air control unit mounted thereon.

Referring now more particularly to the drawing the numeral 1 designates a conventionally illustrated incubator wall. These incubators are at present provided with air inlet apertures, preferably in the back wall, as indicated at 2, and as previously stated these apertures are at the present time controlled by manually actuated slides.

The present invention comprises an oscillatable

shaft 3 which is mounted in spaced parallel relation with the apertured incubator wall, in bearings 4 which may be secured in any suitable manner to the incubator but which are here illustrated as being carried by arms 5 which are secured to plates 6 and these plates are secured to the side wall of the incubator in the manner shown. The shaft 3 at one end is turned to extend outwardly from the incubator wall forming the arm 7 upon which balance weights 8 are threadably secured, and at its other end there is secured to the shaft a vertical longitudinally slotted arm 9 which is here illustrated as being formed of a wire body bent upon itself to form the two spaced parallel portions which have their free ends secured to the shaft 3. Obviously this may be in the form of a rigid plate having a slot punched or cut therethrough.

Extending through the slot 10 of the slotted arm 9 is a threaded post 11 which is flattened, as indicated at 12 at its outer end which has threaded thereon the spaced wing nuts 13 which are disposed upon opposite sides of the slotted arm 9 and which, when brought together, clamp the arm between them so as to hold the threaded bar 11 in any position of adjustment longitudinally of the slotted arm.

The inner end of the threaded bar 11 is secured in a hub 14 which is carried upon one side of the thermostatic wafer which is indicated generally by the numeral 15, and upon the opposite side of the thermostatic wafer from the hub 14, is a stud 16 which bears against the wall 1 of the incubator.

Extending through the slot of the arm 9 above the bar 11, is the threaded end of a screw 17 which has an eye 18 upon the end directed toward the incubator wall and this eye is drawn into engaging relation with the slotted arm by the nut 19 so that the screw may be secured firmly in position upon the arm. The wall 1 of the incubator carries an eye 20 opposite the screw eye 18 and connected between these eyes 18 and 20 is a contractile spring 21 which normally tends to pull the upper end of the arm 9 in toward the incubator wall and thus maintain a firm contact between the end of the stud 16 and the wall.

Secured to the shaft 3 are a number of upwardly and inwardly directed arms 22, corresponding in number with the apertures 2 in the wall of the incubator and each of these arms carries a vertically arranged valve plate 23 which is adapted to position flat against the incubator wall and cover an air opening 2.

From the foregoing it will be readily apparent that at a particular room temperature the plates 23 will lie firmly against the surface of the incubator wall and cover the openings 2 and the end of the thermostatic wafer stud 16 will be in firm contact with the wall, being retained there

by the spring 21. Upon an increase in room temperature the wafer 15 will expand so as to exert pressure against the wall 1 and force the slotted arm 9 outwardly to effect the oscillation of the shaft 3 in a direction to move the plates 23 away from the incubator wall, thus uncovering the apertures 2. The reverse action, of course, will take place when the temperature of the room decreases so that the interior of the incubator may be kept at a substantially constant desired temperature. It will be obvious that the delicacy of operation of the device may be regulated by adjusting the position of the weights 8 upon the arm 7 and also that other adjustments may be made by loosening the wing nuts 13 and shifting them together upon the threaded bar 11, so that if the wafer is moved outwardly from the incubator wall a higher degree of outside temperature will be necessary to effect the movement of the plates 23 from over the openings, but if the threaded bar is moved inwardly toward the wall the device can be initially set with the plates moved away from the openings so that a cooler temperature will be required to close the openings.

While the mechanism disclosed has been illustrated and described as being disposed upon the outside of an incubator wall to control the flow of air into the incubator, it will be readily appreciated that this mechanism might be mounted upon the inside of the incubator wall for the purpose of regulating the outflow of air therefrom. Such air outflow regulation is particularly desirable in incubators during the period immediately preceding the hatching of the eggs.

I claim:

1. In an incubator having a wall provided with air openings, a bar member disposed horizontally of the wall and supported for axial oscillation, arms carried by said bar, cover plates carried by said arms and each adapted to contact the adjacent wall and cover an opening, an upwardly directed arm carried by said bar and disposed in spaced relation with the incubator wall, resilient means coupling the arm with the wall and normally tending to oscillate the same in a direction to effect the engagement of said plates with the wall, and a thermostatic wafer interposed between said last arm and said wall and bearing at one side upon the wall and at its other side having connection with said arm.

2. In an incubator having a wall provided with air openings, a bar member disposed horizontally of the wall and supported for axial oscillation, arms carried by said bar, cover plates carried by said arms and each adapted to contact the adjacent wall and cover an opening, an upwardly directed arm carried by said bar and disposed in spaced relation with the incubator wall, resilient means coupling the arm with the wall and normally tending to oscillate the same in a direction to effect the engagement of said plates with the wall, said arm being longitudinally slotted, a thermostatic wafer having oppositely directed central studs, the wafer being disposed between said wall and the slotted arm and having one of the studs in contact with the wall, a threaded bar extending through the slot of the slotted arm and engaging at one end with the other of said studs, and a pair of wing nuts upon said threaded bar and having said slotted bar secured therebetween.

3. In an incubator having a wall provided with air openings, a bar member disposed horizontally of the wall and supported for axial oscillation, arms carried by said bar, cover plates car-

ried by said arms and each adapted to contact the adjacent wall and cover an opening, an upwardly directed arm carried by said bar and disposed in spaced relation with the incubator wall, resilient means coupling the arm with the wall and normally tending to oscillate the same in a direction to effect the engagement of said plates with the wall, said arm being longitudinally slotted, a thermostatic wafer having oppositely directed central studs, the wafer being disposed between said wall and the slotted arm and having one of the studs in contact with the wall, a threaded bar extending through the slot of the slotted arm and engaging at one end with the other of said studs, a pair of wing nuts upon said threaded bar and having said slotted bar secured therebetween, and counterbalance means carried by the oscillatable bar.

4. In a structure having a compartment with a wall provided with an opening, a bar mounted in parallel relation with the wall and adapted to have axial oscillation, a covering element for said opening supported by the bar for movement relative to the opening when the bar is oscillated, an arm carried by the bar and normally extending in substantially parallel relation with the adjacent wall surface and adapted to have limited arcuate swinging movement with the bar, a thermostatic element interposed between the arm and said wall surface and having connection upon one side with the arm and connected upon its other side with said wall, said element when expanded oscillating said bar by imparting arcuate movement to the bar, and resilient means coupling the arm with the wall and normally urging said bar to oscillate in opposition to the action of the thermostatic element when expanded.

5. In a structure having a compartment with a wall provided with an opening, a bar mounted in parallel relation with the wall and adapted to have axial oscillation, a covering element for said opening supported by the bar for movement relative to the opening when the bar is oscillated, a thermostatic element, coupling means between the bar and said element by which the bar will be given axial rocking movement when the element reacts to a temperature change, resilient means coupled with said bar and normally urging the same to oscillate in one direction, said thermostatic element upon reaction to a temperature change urging the bar to oscillate in opposition to the resilient means, and counterbalance means associated with the bar and acting in opposition to the urge of said resilient means.

6. In a structure having a compartment with a wall provided with an opening, a bar mounted in parallel relation with the wall and adapted to have axial oscillation, a covering element for said opening supported by the bar for movement relative to the opening when the bar is oscillated, a longitudinally slotted arm secured at one end to said bar and normally maintaining a substantially parallel relation with the adjacent wall, a thermostatic wafer disposed between said slotted arm and the adjacent wall and having contact upon one side with the wall, a stud extending from the other side of said wafer through said slotted arm, means for adjustably securing the stud with the slotted arm whereby the wafer may be shifted toward or away from the bar, and resilient means coupled with the bar and normally urging the same to oscillate in a direction to move said wafer toward the adjacent wall.

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