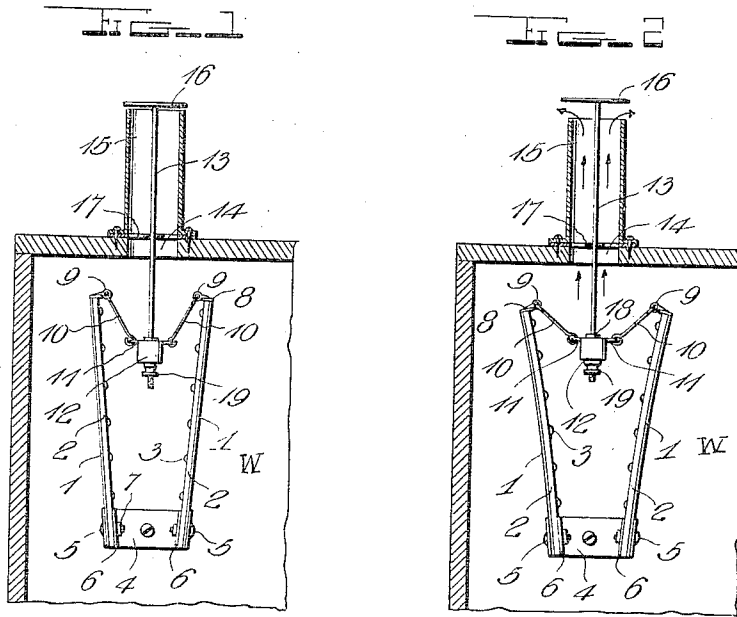
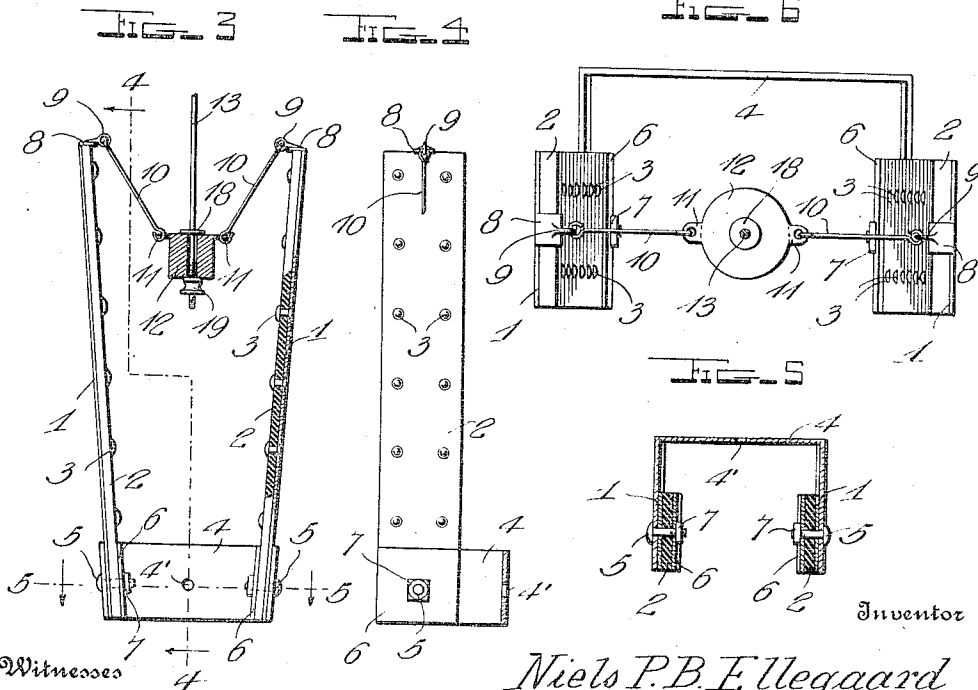


N. P. B. ELLEGAARD.
THERMOSTATIC DAMPER REGULATOR FOR INCUBATORS AND THE LIKE.
APPLICATION FILED JAN. 13, 1913.

1,082,115.

Patented Dec. 23, 1913.



Witnesses

C. E. Hunt
C. E. Hunt

Niels P. B. Ellegaard

By *A. B. Wilson & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

NIELS PETER BRODERSEN ELLEGAARD, OF PETALUMA, CALIFORNIA.

THERMOSTATIC DAMPER-REGULATOR FOR INCUBATORS AND THE LIKE.

1,082,115.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, NIELS PETER BRODERSEN ELLEGAARD, a subject of the King of Denmark, residing at Petaluma, in the county of Sonoma and State of California, have invented certain new and useful Improvements in Thermostatic Damper-Regulators for Incubators and the like; and I do 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.

This invention relates to improvements in thermostatic damper regulators for incubators and the like.

One object of the invention is to provide an improved support for the thermostatic plates whereby they are caused to stand nearly upright and to normally diverge slightly toward their upper ends; and another object is to provide an improved weighted toggle-lever connection between said upper ends so that the latter are normally drawn inward to a slight extent and when they spread apart under the action of heat the result of such action will be felt at first more decidedly by the damper and later less decidedly.

Another object is to provide a thermostatic damper regulator of this character which will be simple, strong, durable and inexpensive in construction, efficient and reliable in operation and well adapted to the purpose for which it is designed.

With these and other objects in view, the invention consists of certain novel features of construction, and the combination and arrangement of parts as will be more fully described and claimed.

In the accompanying drawings: Figure 1 is a vertical sectional view through a portion of an incubator showing my improved thermostatic damper regulator applied thereto and connected with the damper, the latter being shown closed and the regulator in a contracted position; Fig. 2 is a similar view showing the damper open and the regulator in an expanded position; Fig. 3 is an enlarged side view of the regulator and the damper connecting mechanism, parts being broken away and in section; Fig. 4 is a vertical sectional view of the regulator taken on the line 4-4 of Fig. 3; Fig. 5 is a horizontal sectional view taken on the line 5-5 of Fig. 3; Fig. 6 is a top plan view of the regulator.

My improved damper regulator comprises a pair of thermostatic plates, each made up of two elements 1 and 2 having different coefficients of expansion under the action of heat and cold, and connected preferably by double rows of rivets 3 as shown. The plates are secured at their lower ends to and are supported by a substantially U-shaped bracket 4 having in its base portion a screw hole 4' whereby the same may be fastened by a screw or other suitable fastening device to the side wall W of the incubator or the like. The arms of the bracket 4 are preferably twisted or flared outwardly to a slight extent toward their upper edges whereby the plates when secured thereto will diverge slightly toward their upper ends as shown. The plates are secured to the arms of the bracket 4 by bolts 5 which pass also through washers 6 on the inner sides of the lower ends of the plates whereby when the nuts 7 of the bolts 5 are screwed up the lower ends of the plates will be rigidly clamped to the arms of the bracket.

Formed on or secured to the upper ends of the thermostatic plates are centrally disposed inwardly extending lugs 8 to which are secured eyes 9. To the eyes 9 are connected the outer ends of links 10 which project downwardly and inwardly between the plates and have their inner ends engaged with apertured ears 11 formed on the upper end of a damper closing weight 12. It will be observed that the construction including the links pivotally supported at their outer ends and connected by a weight at their inner ends, constitutes in effect a toggle lever which stands as shown in Fig. 1 when the parts are in their normal position. At this time the weight 12 actuates the toggle to draw the upper ends of the thermostatic plates slightly inward out of the lines of divergence they would ordinarily assume by reason of the flare of the arms of the bracket.

In the weight 12 is formed a vertical centrally disposed passage with which is engaged the threaded lower end of a damper operating rod 13 which extends upwardly through an opening 14 in the top of the incubator and through a tube 15 arranged over said opening. The rod 13 is connected at its upper end with a damper plate 16 which is adapted to open and close the upper end of the ventilating tube 15. The rod 13 is held centrally and slidably supported in the tube

15 by a spider 17 secured to the top of the incubator over the opening 14. On the lower portion of the rod above and engaged by the top of the weight 12 is a collar 18 while on the threaded lower end of the rod 13 is secured a clamping nut 19 whereby the weight is fastened to the rod 13 between the nut and the collar 18 as clearly shown in Fig. 3 of the drawings.

10 When thus constructed and supported the heat of the incubator acting on the thermostatic plates will cause the latter to curve outwardly or away from each other at their upper ends as clearly shown in Fig. 2 of the drawings and draw upwardly on the links 15 10 of the toggle thereby raising the weight 12 and the damper operating rod 13 which will lift the damper above the upper end of the ventilating tube and permit the heat to 20 escape from the incubator. When the temperature therein has fallen to a sufficient degree for acting on the thermostatic plates they will straighten, thus permitting the weight 12 to descend and close the damper 25 16 on the upper end of the ventilating tube as will be readily understood.

Attention is directed to the fact that the use of the toggle lever to connect the upper ends of the thermostatic plates with the damper has a peculiar effect on the latter. That is to say, starting with the parts in the position shown in Fig. 1, when said upper ends commence to diverge by reason of the heat the first action of the toggle lever on the rod 13 is considerable and a slight curvature of the plates will open the damper 35 16 quickly, so that the damper is sensitive to the thermostatic action. When the parts reach a position about as shown in Fig. 2, by which time the damper has been opened somewhat, the further outward curvature of the thermostatic plates results in much less movement upward of the rod and therefore much less opening of the damper 40 to a greater extent. It can be understood that if the plates should curve to such an extent that the links 10 stand horizontal the upward movement of the rod and the opening of the damper would cease entirely, yet 50 the fact that there is a weight at the center of the toggle prevents the latter from straightening out or its center from rising above its ends with disastrous results. Assuming that something happens whereby the heat increases quickly but perhaps temporarily; the first result is to spread apart the upper ends of the thermostatic plates which opens the damper as seen in Fig. 2, and the excess of warm air within the incubator is permitted to escape, and this condition will be maintained so long as the excess of heat is continued within the incubator. The second result, in case the heat should further increase, would be to spread the plates apart 65 farther and raise the damper yet a little

higher, so that even more of the heat within the incubator could escape; although by this time the unusual condition will doubtless have passed. But suppose it does not, then the last effect of the excess of heat would be to raise the links 10 to probably about a horizontal position, beyond which they can go no farther, and this opens the damper 16 to its widest extent so as to make provision for the unusual condition. The incubator is now so thoroughly ventilated that even the greatest and most unusual volume of heat will be counteracted, but in any event the toggle lever prevents the damper from opening wider or the plates from spreading apart farther and therefore this position of parts is maintained without damage to the instrument and until the temperature again falls.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various 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 the invention as claimed.

Having thus described my invention, what I claim is:

1. In a thermostat, the combination with a casing, and a horizontally disposed U-shaped bracket whose base is fastened to the side wall of said casing and whose arms stand substantially parallel but are twisted throughout their length so as to flare toward their upper edges; of two upstanding thermostatic plates, the lower end of each being secured to one of said arms, devices connecting their upper ends, and connections between said devices and the part to be regulated.

2. In a thermostat, the combination with a casing, and a horizontally disposed U-shaped bracket whose base is fastened to the side wall of said casing and whose arms stand substantially parallel but are twisted throughout their length so as to flare toward their upper edges; of two upstanding thermostatic plates, the lower end of each being secured to one of said arms, a ventilator in the top of said casing, weighted devices connecting the upper ends of said plates, and connections between said devices and damper.

3. In a thermostat, the combination with a casing, and a horizontally disposed U-shaped bracket whose base is fastened to the side wall of said casing and whose arms stand substantially parallel but are twisted throughout their length so as to flare toward their upper edges; of two upstanding thermostatic plates, the lower end of each being secured to one of said arms, a toggle lever

connecting their upper ends, a weight at the mid-length of said toggle, the weight drawing the upper ends of said plates normally inward to a slight extent, and connections between this weight and the part to be regulated.

4. In a thermostat, the combination with a casing, and a horizontally disposed U-shaped bracket whose base is fastened to the side wall of said casing and whose arms stand substantially parallel but are twisted throughout their length so as to flare toward their upper edges; of two upstanding thermostatic plates, the lower end of each being secured to one of said arms, lugs at their upper ends having eyes; links engaged at their outer extremities with said eyes, a weight having apertured ears engaged with the inner ends of said links, and a rod extending upward from said weight and connected with the part to be regulated.

5. In a thermostatic regulator for incubators, the combination with a bracket carried by the wall of the incubator, a pair of upstanding slightly divergent thermostatic plates carried by said bracket, a weight, links connecting the weight with the upper ends of said plates, the top of the incubator having an opening, and a tube rising therefrom; of a damper plate above said tube,

a rod connected with said plate and passing downward through the tube and opening and through said weight, the rod having a collar above the weight, and a nut on the lower end of the rod beneath the weight, for the purpose set forth.

6. In a thermostatic regulator for incubators, the combination with a bracket carried by the incubator body, the latter having a hole through its top, a damper controlling said hole, and a pair of upstanding slightly divergent thermostatic plates carried by said bracket within the incubator; of a toggle lever whose links are pivotally connected at their outer ends with the upper ends of said plates and which lever includes a weight pivotally connected with the inner ends of said links and standing between the thermostatic plates, the weight having an upright hole through its body, a rod leading from said damper through said hole, and a nut on the rod, for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

NIELS PETER BRODERSEN ELLEGAARD.

Witnesses:

HANS HANSEN,
JULIUS FRITZ.