C. E. ADAIR.

REGULATOR FOR INCUBATOR HEATERS.

APPLICATION FILED MAR. 24, 1905.

987,664. Patented Mar. 21, 1911.

FIG. 1.

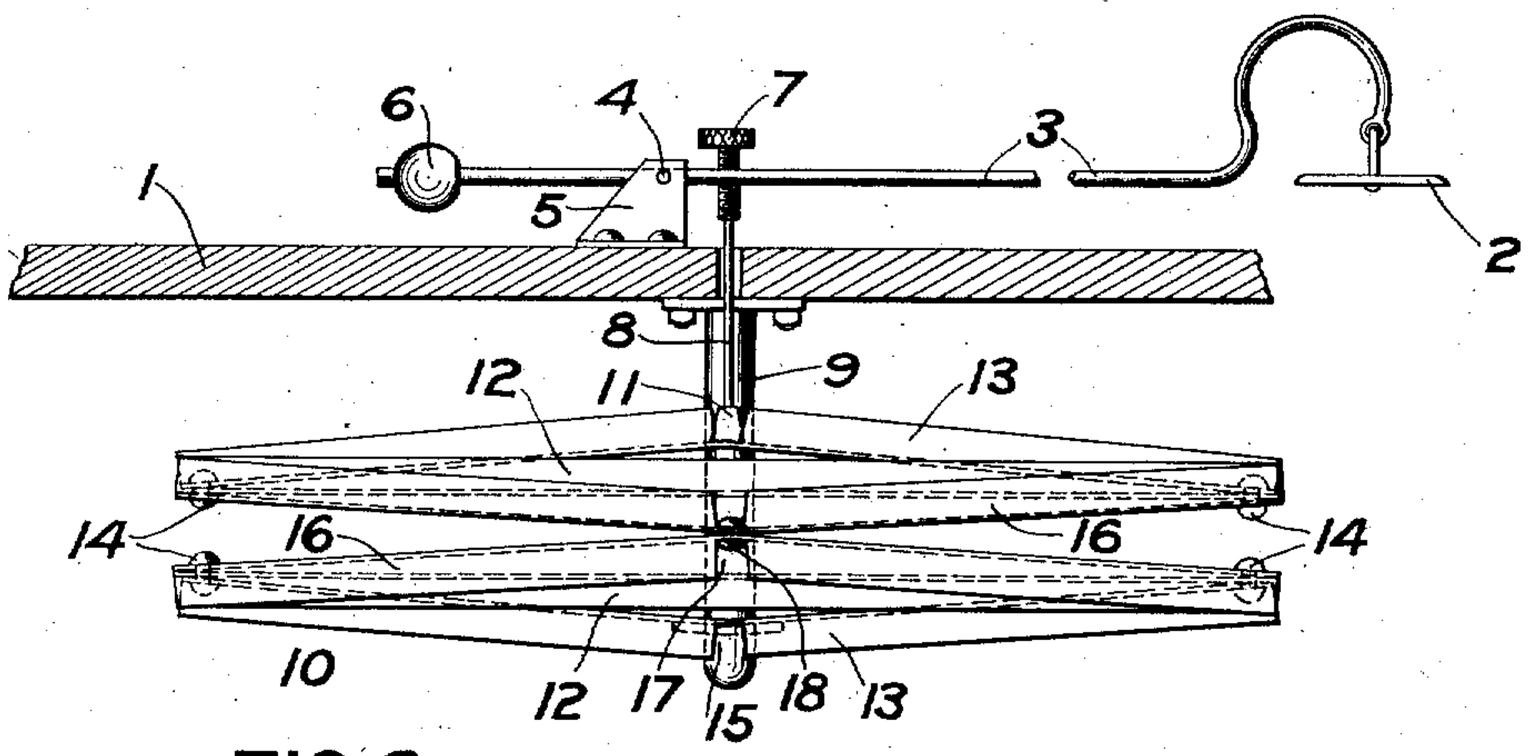
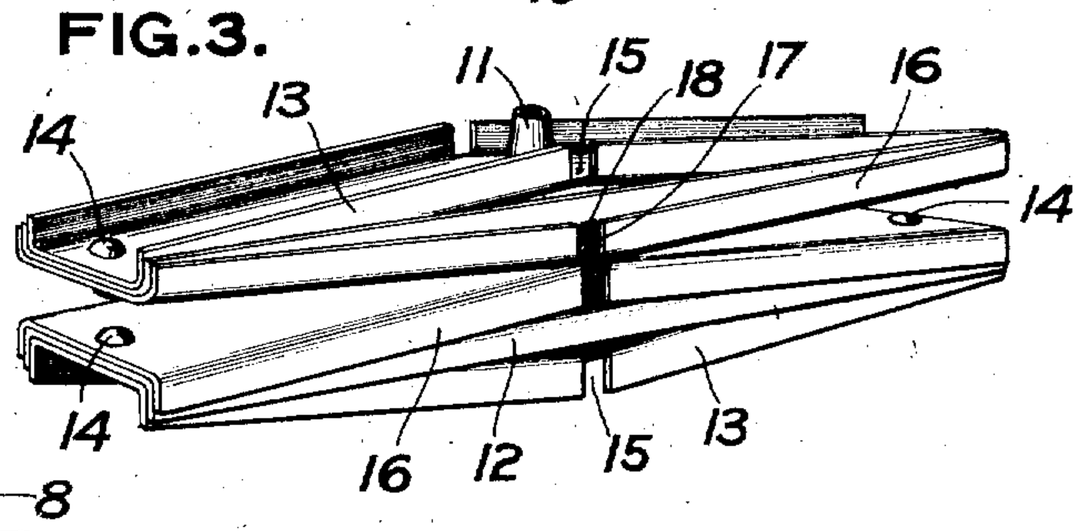


FIG. 3.



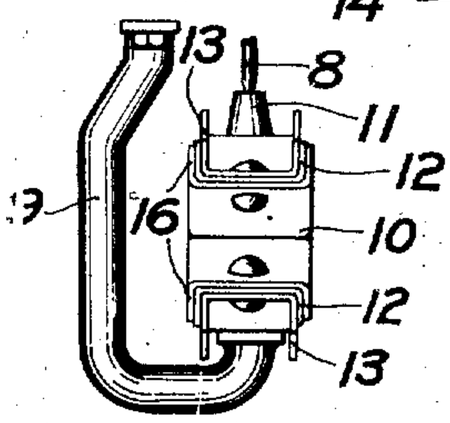
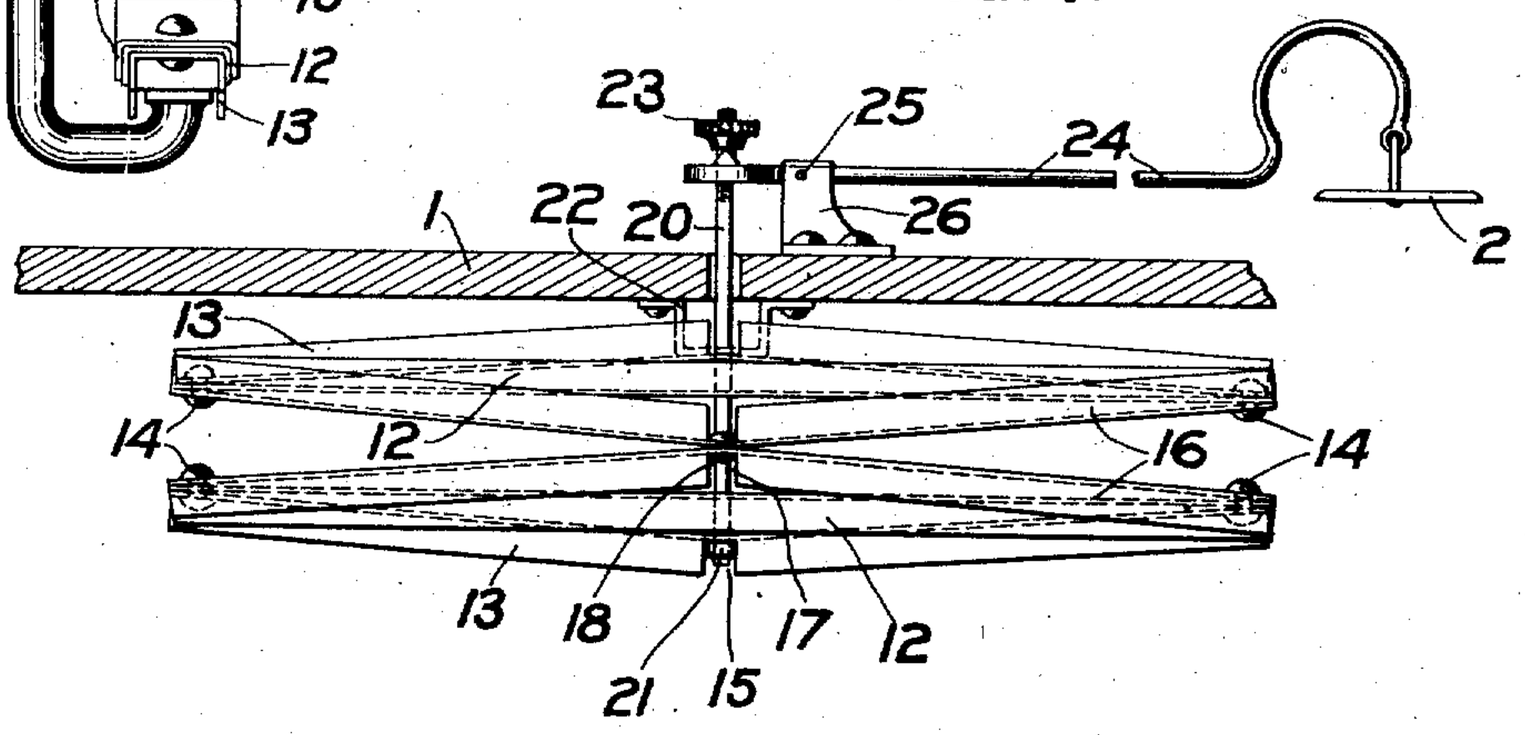


FIG. 2.

FIG. 4.



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UNITED STATES PATENT OFFICE.

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REGULATOR FOR INCUBATOR-HEATERS.

987,664. Specification of Letters Patent. Patented Mar. 21, 1911.

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To all whom it may concern:

Be it known that I, CHARLES E. ADAIR, a citizen of the United States, and resident of Leesville, in the county of Carroll and State of Ohio, have invented certain new and useful Improvements in Regulators for Incubator-Heaters, of which the following is a specification.

This invention relates to regulators for incubator heaters, and consists in the devices hereinafter described and claimed.

In the drawings:—Figure 1 is an elevation of a regulator embodying this invention, shown as attached to the top of an incubator, which top is shown in cross-section. Fig. 2 is a side elevation of the hanger and the expansion and contraction mechanism of said regulator; Fig. 3 is a perspective view of said expansion and contraction mechanism; and Fig. 4 is an elevation of a modified form of the mechanism shown in Fig. 1.

In the drawing, 1 is the top of an incubator. 2 is a damper adapted to control the heater of said incubator.

3 is the damper rod that is pivoted at 4 on the frame 5 on the incubator 1, and 6 is a counterweight, adjustable if desired, for nearly balancing the damper side of the damper rod 3. The said damper rod carries means, which may be adjustable, and may then be a screw 7, for engaging a rod 8 for a purpose to be described. In the interior of the incubator is the hanger 9, shown in Figs. 1 and 2, which is attached to the lower surface of a suitable portion of the incubator, such as the top 1, and extends down and laterally, as shown most plainly in Fig. 2, so that upon it the expansion and contraction mechanism may rest. The rod 8 rests upon the top of said expansion and contraction mechanism, and may be conveniently set in a cup 11 on the top of said expansion and contraction mechanism.

The expansion and contraction mechanism is a thermostatic device which, by changes of heat, can produce movement of the damper rod 3 through the connection made by the rod 8. The thermostatic device is composed of flat bars having their edges turned at an angle to the center of said bars so as to produce practically the shape of a channel iron. These bars are so proportioned as to nest in each other, as shown in Fig. 3. The thermostatic apparatus consists in its simplest form of the straight plate or channel iron 12 and the bent channel iron 13 nesting in or upon the channel iron 12, and having its ends fastened, as by the rivets 14, to the other channel iron. The bent channel iron 13 is bent only at its middle, at which point notches 15 are cut from its turned edges so as to leave only a portion of the center of said channel iron and to produce a short but flexible flat portion thereof. When the outer ends of the two channel irons are fastened together, the middle of the channel iron 13 is raised a suitable distance away from the channel iron 12.

In order to increase the amplitude of movement upon a rise in temperature, the thermostatic elements are multiplied to the extent shown in Figs. 1 and 2, or even more. In the case shown there are two systems, each having the center channel iron 12, the inner channel iron 13 nesting inside said channel iron 12, and the outer channel iron 16 having the notches 17 in the centers of its side flanges and nesting around the channel iron 12. The channel irons 16 are fastened together at their middle points, as shown in Figs. 1 and 2, by suitable fasteners, such as the rivets 18. The lowest member of the combined systems rests and is fastened at its center to the hanger 9, while the cup or socket 11 is on the uppermost member. It will now be seen that contractions and expansions of the systems will cause increased movement in proportion to the number of thermostatic elements employed. Of course, it is necessary that the middle element 12 should be of different expansibility per degree of heat from the bent elements 13 and 16. Brass and iron form a practicable combination, and the apparatus shown has the outer bent members 13 and 16 of greater expansibility than the middle member 12, in which case, upon a rise in temperature, the rod 8 is pushed upwardly and the damper is raised.

In Fig. 4 the same system of thermostatic elements is shown as in Figs. 2 and 3, but the system has a series of perforations through which passes a rod 20 which is fastened in a suitable way, as by a nut 21, to the lowest member of the thermostat; and the uppermost member of the thermostat is fastened by the support 22 to the under side of a suitable portion of the incubator, such for instance as the roof 1. The rod 20 continues upward, and by suitable means, such as the

adjustable nut 23, engages the upper side of a damper bar 24, which is pivoted as at 25 to a support 26 between the rod 20 and the damper 2. This latter device holds the rod 20 downward. The device described before pushes the rod 8 upward.

The parts 12, 13 and 16 are channel plates of different widths and have their ends nested as shown; that is, the outer channel plates 13 are nested in the intermediate channel plates 12, and the intermediate channel plates 12 are nested in the inner channel plates 16. The ends of each set of channel plates are secured together by suitable means, such as the rivets 14. The thermostat may be called an influencer or operating device for regulator parts, such as the rod 8 or 20, the damper rod 3 or 24 and the damper 2. In the double thermostatic apparatus, the inner channel plates 12 and the outer channel plates 13 have their channel flanges cut away at their middle part to form the notches 15 and 17, and the channel plates 16 are secured together at their middle part by means of the rivet 18.

What I claim is:—

1. In a thermostat, the combination of a plurality of channel plates secured together at their ends, said plates being of different widths and having their ends nested substantially as described.

2. A thermostat comprising an influencer consisting of inner channel plates having their flanges cut away at the middle part, intermediate channel plates nested in the inner channel plates, outer channel plates having their flanges cut away at the middle part and nested in the intermediate channel plates, means for securing the inner channel plates together at the middle part, means for securing the ends of the lower set of channel plates together, and means for securing the ends of the upper set of channel plates together, and regulator parts.

3. In a thermostat, the combination of a plurality of channeled plates having their ends nested and rigidly connected, one of said plates being provided with a centrally disposed reduced portion.

4. In a thermostat, the combination of a pair of channeled plates having their ends nested and rigidly connected, the flanges of both of said channeled plates being cut away at the central portion thereof.

5. In a thermostat, the combination of a channeled plate, bowed channeled plates on opposite sides of said first mentioned channeled plate, the ends of all of said channeled plates being nested and rigidly connected.

6. In a thermostat, the combination of a channeled plate, bowed channel plates on opposite sides of said first mentioned channeled plate provided with centrally reduced portions, the ends of all of said channeled plates being nested and rigidly connected.

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