

(No Model.)

M. T. GREENLEAF.

THERMOSTATIC VALVE FOR INCUBATORS.

No. 388,666.

Patented Aug. 28, 1888.

Fig. 1.

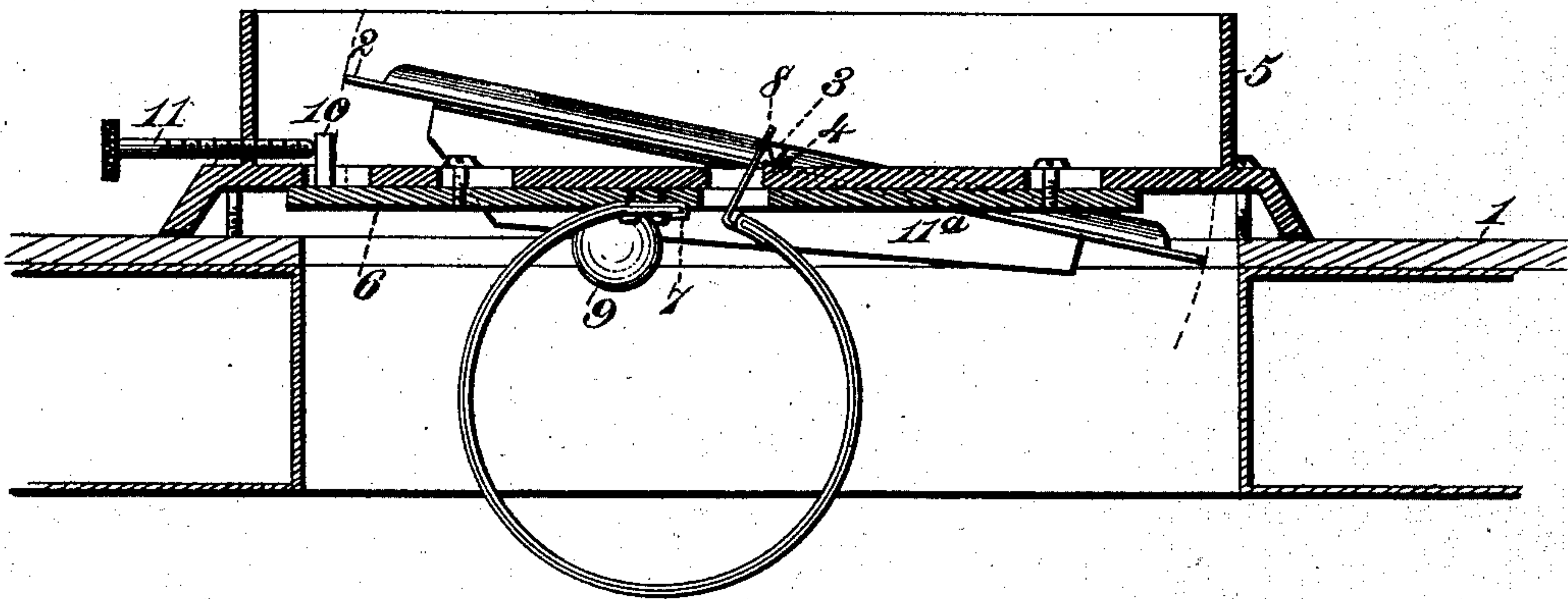


Fig. 2.

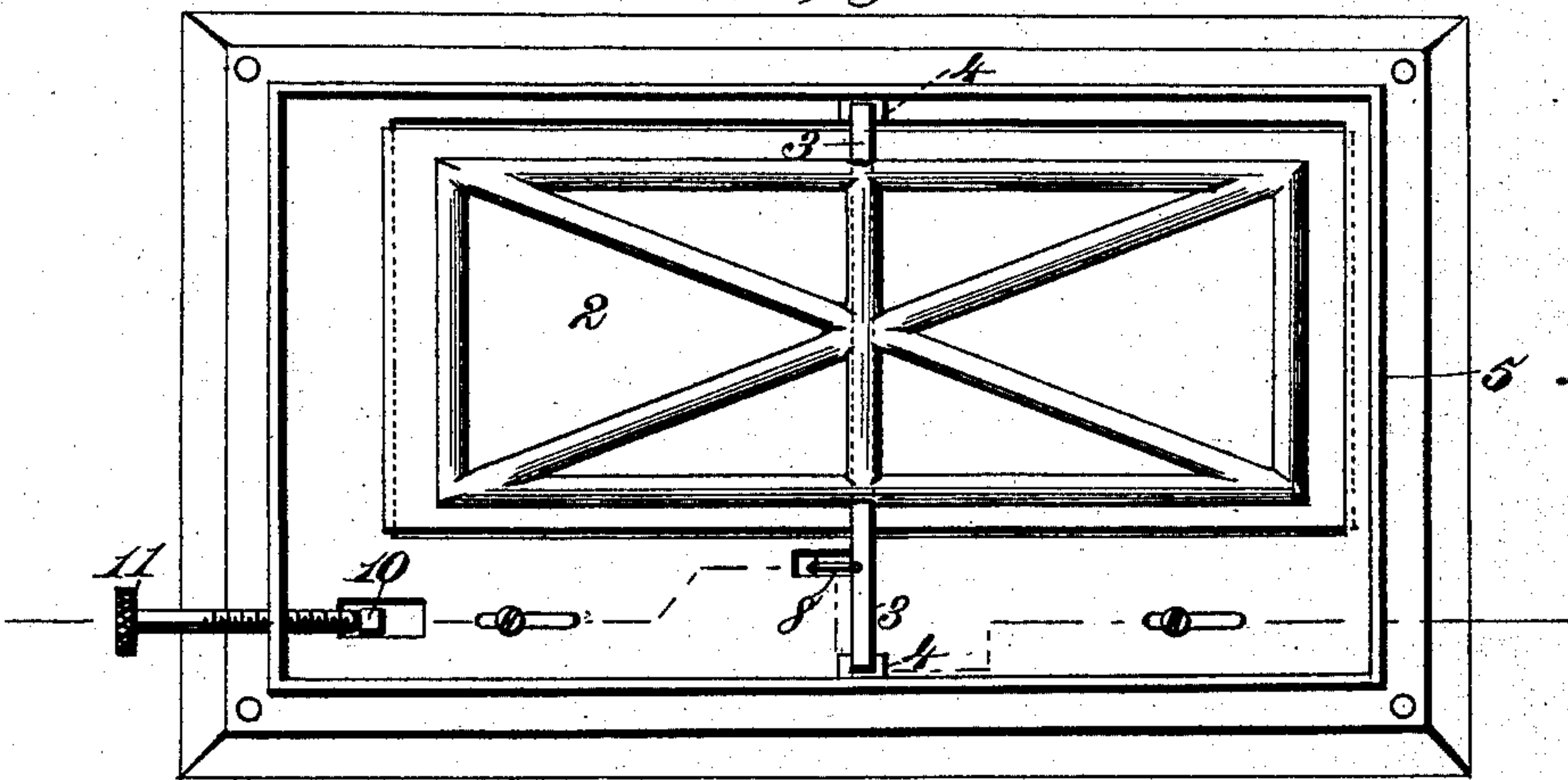
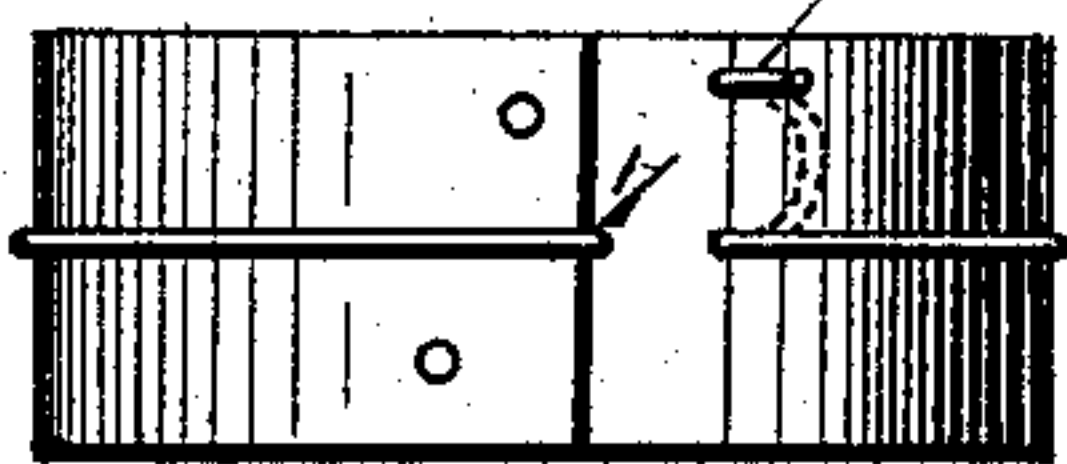


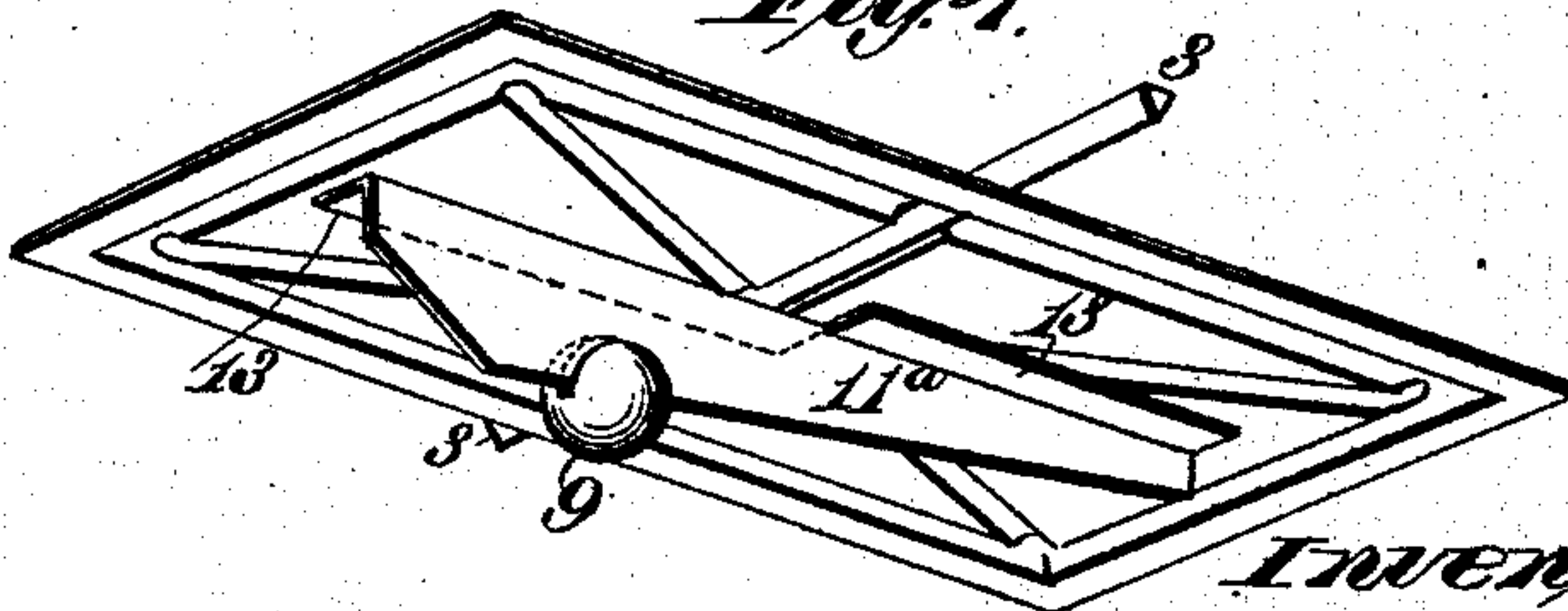
Fig. 3.



Witnesses.

Robert Emmett,
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Fig. 4.



Inventor.

Miller T. Greenleaf,
By James L. Norris,
Att'y.

UNITED STATES PATENT OFFICE.

MILLER T. GREENLEAF, OF QUINCY, ILLINOIS.

THERMOSTATIC VALVE FOR INCUBATORS.

SPECIFICATION forming part of Letters Patent No. 388,666, dated August 28, 1888.

Application filed November 22, 1887. Serial No. 255,899. (No model.)

To all whom it may concern:

Be it known that I, MILLER T. GREENLEAF, a citizen of the United States, residing at Quincy, in the county of Adams and State of Illinois, have invented new and useful Improvements in Incubators, of which the following is a specification.

My invention relates to incubators for the artificial hatching of poultry; and the purpose thereof is to provide an extremely simple device for automatically regulating and preserving the temperature of the interior of the hatching-compartment.

It is also my purpose to provide means whereby the automatic apparatus may be adjusted to act at any predetermined point within certain limits, the whole being of uniform and certain operation, not liable to derangement, and of sensitive and exact action.

The invention consists in the several novel features of construction and new combinations of parts, hereinafter fully set forth, and specifically pointed out and defined in the claims.

In the accompanying drawings, Figure 1 is a sectional view illustrating my invention. Fig. 2 is a plan view of the same. Fig. 3 is a detail view of the thermostat detached. Fig. 4 is a detail view of the ventilator-plate, showing the manner of balancing the same.

In the said drawings the reference-numeral 1 denotes one of the hatching-compartments of an incubator of any ordinary construction, save as to those points hereinafter described. Closing the top of this compartment is a ventilator-plate, 2, which may be centrally hung upon a pivot or transverse rock-bar; but I prefer to support the plate upon a bar, 3, which is triangular in cross-section, the ends resting upon the acute angle of the triangle and forming practically knife-edge bearings. These bearings rest upon suitable stationary supports, 4, forming part of the frame.

Surrounding the ventilator 2 and rising to a suitable height is a screen-wall, 5, which prevents the plate from being deflected by accidental currents of air.

Mounted in any suitable manner upon the top of the compartment 1, whereby it may have longitudinal adjustment, is a plate or support, 6, arranged upon one side of the ventilator-plate 2. Attached thereto in the man-

ner to be described is the thermostat consisting of a plate of brass and a bar or wire of steel laid thereon and fastened thereto between the ends of said plate by soft solder. The parts are then bent into circular form, the steel wire being outside and looped over the end of the brass plate, as shown at 7, to retain the parts in the proper relative position. From the loop the wire passes upward, and its end 8 is bent to bear against the upper angle of one of the ends of the knife-edge 3. The other end of the thermostat is brought into proximity to the support 6, which is so mounted upon the top of the hatching-compartment as to have a limited longitudinal movement. When exposed to heat, the unequal expansion of the two metals causes the circular plate and wire to straighten, or tend to straighten, thereby causing the point 8 to bear against the knife-edge bearing and tilt the ventilator, thereby permitting the escape of a portion of the heated air contained therein, the place thereof being supplied by cooler air. When the temperature is reduced sufficiently, the contraction of the metals causes the ends of the thermostat to draw together and resume their former position, whereon the valve closes by gravity, a light weight, 9, being placed on one end for that purpose.

Upon the support 6, I form a lug, 10, against which a set-screw, 11, has bearing, to give adjustment to the support toward or from the knife-edge bearing, on which the end 8 of the thermostat rests. By operating this screw the parts may be so adjusted that the thermostat will swing the ventilator at a higher or lower temperature, as circumstances may require, the points of action relatively to the thermometric scale being marked upon a suitable scale or readily determined by a thermometric tube within the chamber.

I prefer to make the ventilator-plate of corrugated metal to give the necessary rigidity and lightness.

In balancing the ventilator I prefer to attach a bracket formed by cutting a slot in one edge of a strip of metal and bending the metal in opposite directions on each side of the slot, leaving a central fin or strip, 11^a, standing at right angles to the oppositely-extending parts 13. The latter being soldered upon the under

side of the plate 2, a lead ball, 9, having a slot, is placed upon the strip 11^a and moved along until the proper balance is ascertained, when it is soldered in place. By this method I am
5 enabled to balance a great number of plates in a very short time.

I may use any two metals having different indices of expansion in place of brass and steel, as it is evident that many other substances
10 would accomplish the same result.

What I claim is—

1. In an incubator, the combination, with a box or hatching-compartment having a ventilator-plate mounted upon a central axis having
15 knife-edge bearings, of a thermostat composed of two metals of different expansibility curved into circular form, one end of said thermostat being rigidly mounted upon the top of the compartment and the free end bearing
20 against the top of one of the knife-edge bearings, substantially as described.

2. In an incubator, a ventilator-plate having central knife-edge bearings, a thermostat composed of brass and steel or other metals
25 having different indices of expansion bent into

nearly circular form, an adjustable support, to which one end of said thermostat is rigidly fastened, and a set-screw for adjusting said support to bring its free end nearer to or farther from the knife-edge bearing, substantially
30 as described.

3. A ventilator-plate having a bracket attached, provided with a strip of metal lying lengthwise of said plate and at right angles to its surface, and a ball straddling said strip
35 and soldered thereto, substantially as described.

4. A ventilator-plate having a bracket consisting of a strip, 12, having oppositely-extending pieces 13 soldered on one surface of
40 the ventilator-plate, and a ball, 14, straddling the strip and soldered thereto, substantially as described.

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

M. T. GREENLEAF.

Witnesses:

JAMES L. NORRIS,

J. A. RUTHERFORD.