No. 868,630. PATENTED OCT. 15, 1907.

J. HOMAN.

THERMOSTAT.

APPLICATION FILED NOV. 9, 1906.

Fig. 1.

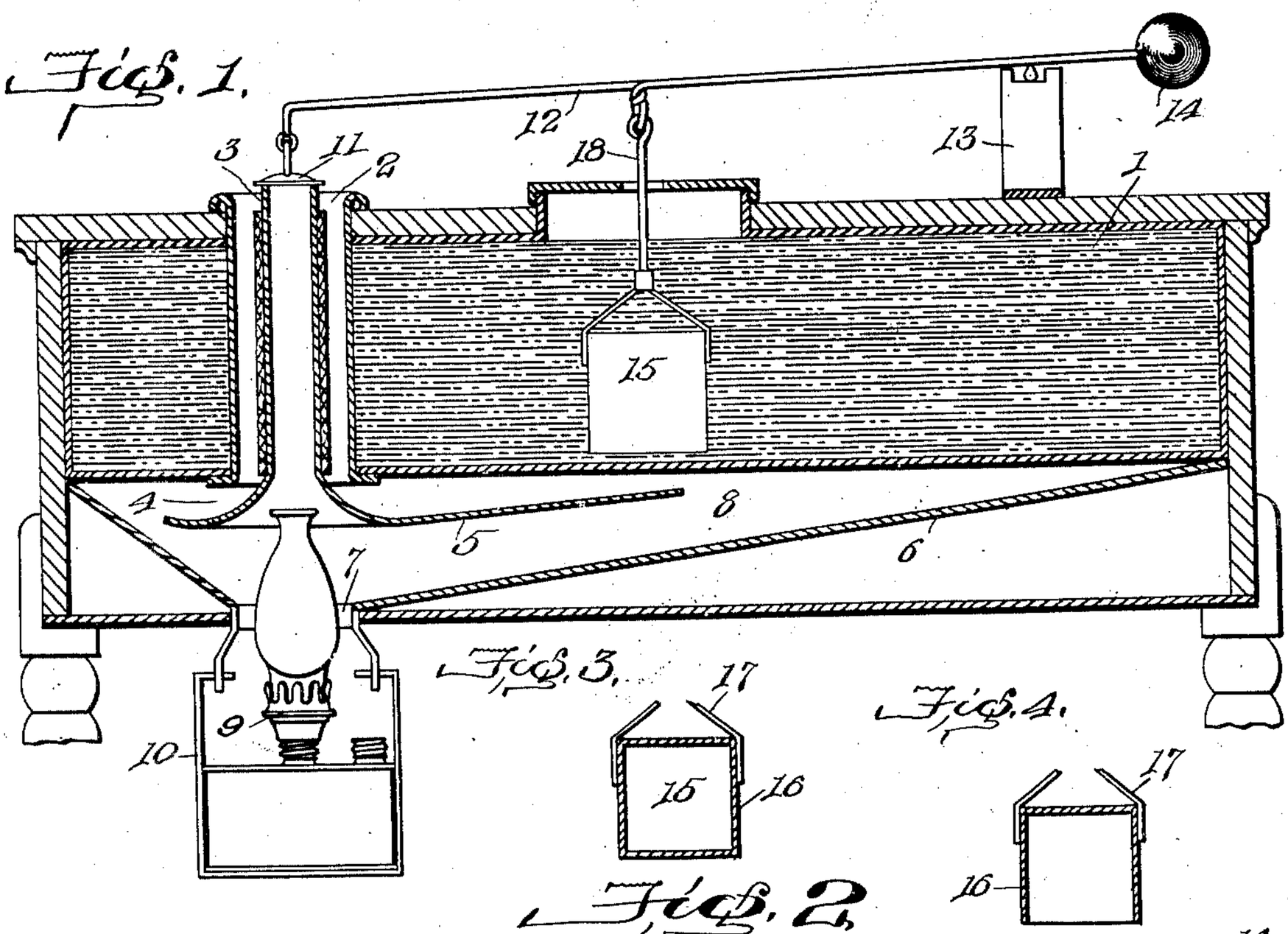
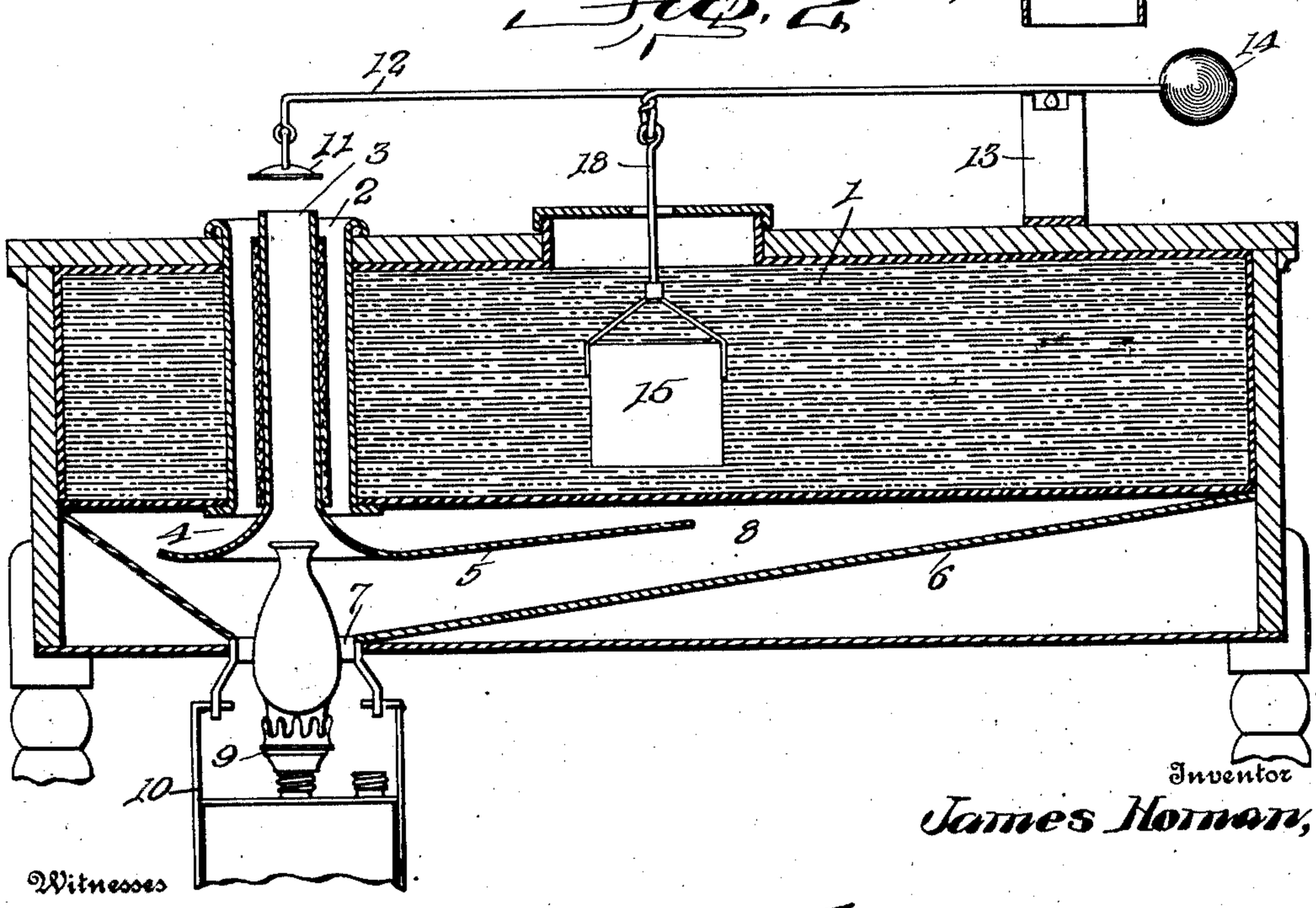


Fig. 3.

Fig. 4.

Fig. 2.



Witnesses

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THERMOSTAT.

No. 868,630. Specification of Letters Patent. Patented Oct. 15, 1907.

Application filed November 9, 1906. Serial No. 342,668.

To all whom it may concern:

Be it known that I, JAMES HOMAN, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Thermostats, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to thermostats, and more particularly to a thermostatic float for controlling the heat applied to the egg chamber of an incubator, and the object of the invention is to provide such a device which will positively and accurately vary the position of the heat regulating device as the temperature in the incubator varies and which can be adjusted to maintain any desired degree of temperature within said incubator.

With these ends in view my invention consists in certain novel features of construction to be hereinafter described, and then more fully pointed out in the claims.

In the accompanying drawings, Figure 1 is a transverse sectional view of an incubator showing the thermostatic float in its lowest position with the damper closed; Fig. 2 is a similar view showing the float in its raised position with the damper open; Fig. 3 is a detail sectional view of the float; and Fig. 4 is a detail sectional view of a modification of the same.

In these drawings, I have shown my invention as applied to an incubator of the type set forth in an application filed by me of even date herewith, but the application of the invention is not confined to incubators of this type but may be employed with any incubator using hot water as a heating medium for the egg chamber and it may further be used in devices other than incubators where it is desired to regulate the temperature of a body of water.

The incubator disclosed in the above mentioned application includes an egg chamber having a water chamber extending on a plurality of the sides of said egg chamber, and the drawings of the present application illustrate a section of this incubator taken through the water chamber shown at 1. A heat flue 2 extends through the water chamber and within the flue 2 is mounted a second flue 3 arranged centrally thereof and having its lower ends flared, as at 4, and provided with an outwardly extending flange 5 which projects for a considerable distance beneath the wall of the water chamber 1. Beneath this water chamber is a wall 6, having downwardly converging sides terminating in an aperture 7 and forming a heat chamber 8 beneath the bottom of the water chamber. A lamp, or other source of heat supply 9 is carried by a suitable support 10 beneath said heat chamber and projects through the aperture 7 in the wall 6 having the upper end of the chimney thereof extending into the flared portion of the central heat flue. The passage of the heat through this central flue is controlled by a damper or cap 11 which is carried by a rod 12, pivotally mounted at 13 and provided with a counterweight 14. When the damper 11 is closed, as shown in Fig. 1, the heat from the lamp 9 is obliged to pass down and around the outer edge of the flange 5, carried by the central flue 3, and to come into contact with a large portion of the lower surface of the water chamber 1, thereby heating the same. When the damper 11 is raised to its full extent, the heat from the lamp passes directly through the central flue 3 into the atmosphere without coming into contact with the walls of the water chamber and without affecting the temperature of the water within said chamber. In order to regulate the position of this damper relatively to the central flue and thereby maintain the water in said chamber at the desired degree of temperature, I connect to the rod 12, carrying the damper 11, a float 15 preferably consisting of a substantially rectangular receptacle or casing, having its walls 16 formed of thin sheet metal, such as brass, and provided at its upper edge with a bail 17, whereby it is connected to a rod 18 depending from the rod 12. The float 15 is filled at a given temperature with an expansible fluid, such as air or a suitable gas, and is then hermetically sealed. The temperature at which the float is filled is such that when immersed in water at a given temperature it will occupy its lowermost position in the chamber, thereby closing the damper 11 of the central flue 3, as shown in Fig. 1, and cause the heat from the lamp to pass around the outer edge of the flange 5 and come in contact with the lower wall of the water chamber. The continued application of heat to the wall of this chamber raises the temperature of the water therein and causes the fluid within the float 15 to expand, thereby extending the walls of the float and displacing a greater amount of water, and, following the well known law of hydrostatics, causing the float to rise to a higher position in said chamber, thus opening the damper 11, to which it is connected, and allowing the heat to escape directly through the central flue to the atmosphere without affecting the temperature of the water within the chamber. As the water cools the float again contracts and sinks to a proportionately lower position in the water chamber, thereby again closing or partially closing the damper 11 and obliging the heat to again come into contact with the walls of the water chamber. The fluid, with which the float is filled, expands to a greater extent than does the water in the chamber when raised to the same degree of temperature, thereby diminishing the specific gravity of the fluid in the float to a greater extent than the specific gravity of the water is diminished.

In practice, the float 15 will soon find the level in the water chamber at which the damper will be closed

to an extent sufficient to cause enough of the heat to come into contact with the wall of the water chamber to maintain the water therein at the proper temperature and the float will have but little movement in the operation of the device.

I have described the float as consisting of a hermetically sealed receptacle, but the construction of the same may be modified without departing from the principle of the invention. I have shown one such modification in Fig. 4, in which the float is formed with its lower edge opened and adapted, when immersed in the water, to confine the atmosphere contained therein between the water in the chamber and the walls of the float, and this air expanding and contracting under the influence of the heat in the chamber will cause the float to rise and fall in the water after the manner described above.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The combination, with a water chamber, means for applying heat thereto and means for regulating the application of said heat to said chamber, of an expansible float immersed in the water in said water chamber and connected to said heat regulating means whereby the variation of the heat in said chamber controls the position of the float therein and regulates said heat-controlling means, substantially as described.

2. The combination, with a water chamber, means for applying heat thereto and means for regulating the application of such heat to said water chamber, of an expansible float immersed in the water in said water chamber and connected to said heat regulating means and containing an expansible fluid whereby the variation of the temperature of said water will vary the amount of water displaced by said float and cause said float to vary its position in said chamber, thereby operating said heat regulating means, substantially as described.

3. The combination, with a vessel containing water and means for heating said water, of a thermostatic float immersed in the water in said vessel and comprising a receptacle containing a fluid adapted to expand under the influence of heat, whereby the expansion of the fluid within said receptacle will cause said float to rise and fall in said vessel, and means actuated by the rise and fall of said float for controlling said heating means, substantially as described.

4. The combination, with a vessel containing water and means for heating said water, of a thermostatic float comprising a receptacle having expansible walls and a fluid contained within said receptacle and adapted to expand under the influence of heat, whereby the expansion of said fluid will expand the walls of said receptacle and cause the same to rise and fall in said vessel, and means actuated by the rise and fall of said float for controlling said heating means, substantially as described.

5. The combination, with a vessel containing water and means for heating said water, of a thermostatic float supported within said vessel and comprising a hermetically sealed receptacle having expansible walls, and an expansible fluid contained within said receptacle, the expansion whereof will cause said float to rise and fall in said vessel, and means actuated by the rise and fall of said float for controlling the heating means, substantially as described.

6. The combination, with a vessel containing water and means for heating said water, of a thermostatic float supported within said vessel and comprising a receptacle having flexible walls filled with an expansible fluid at a fixed temperature and hermetically sealed, whereby the expansion of said fluid within said flexible walls will cause said float to rise and fall in said vessel, and means actuated by the rise and fall of said float for controlling said heating means, substantially as described.

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

JAMES HOMAN.

Witnesses:
E. O. HAGAN,
EDWARD L. REED.