H. B. TATHAM, Jr.

Heat-Regulating Device for Incubators.

No. 226,568. **Patented April 13, 1880.**

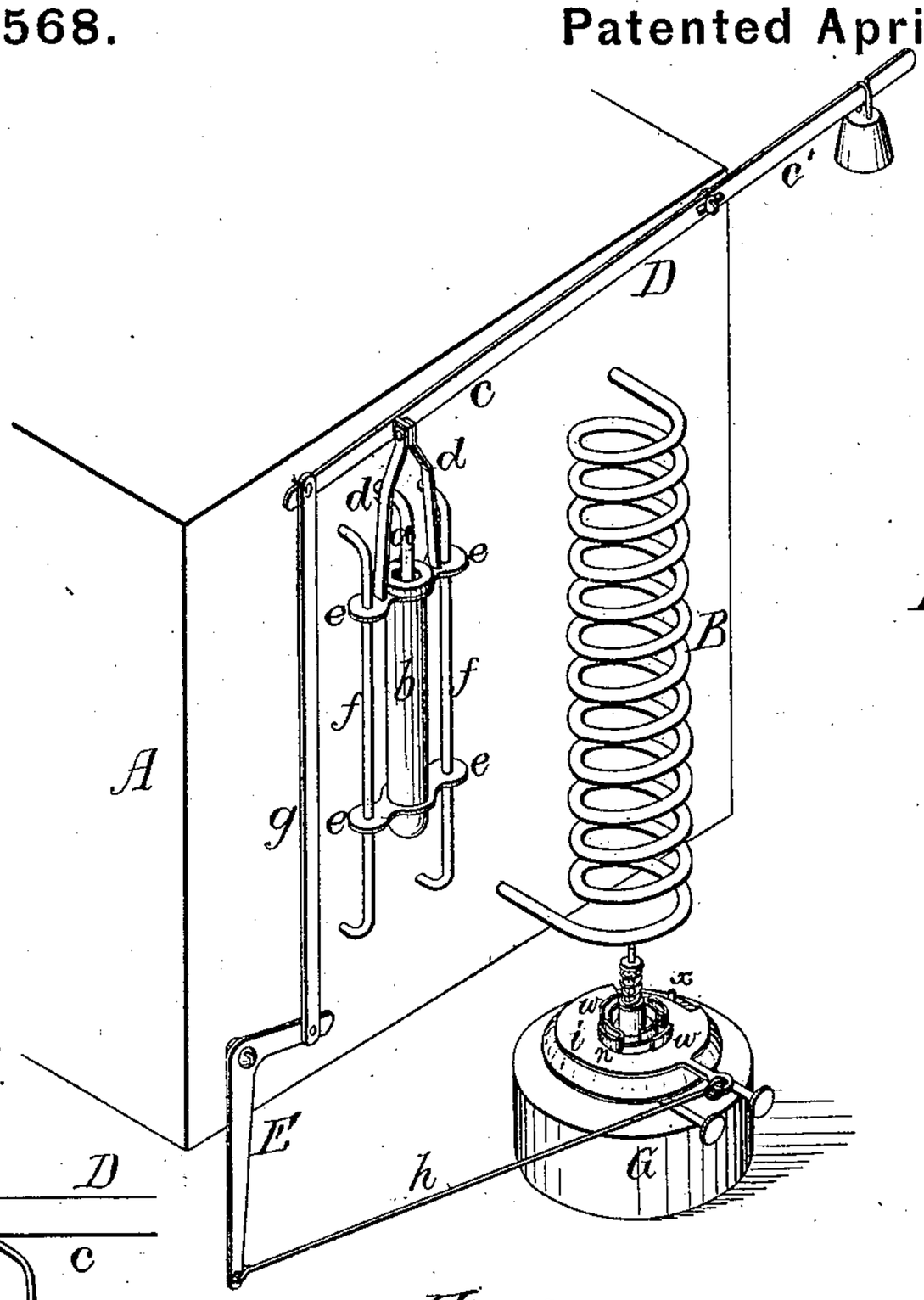


Fig. 1.

Fig. 2.

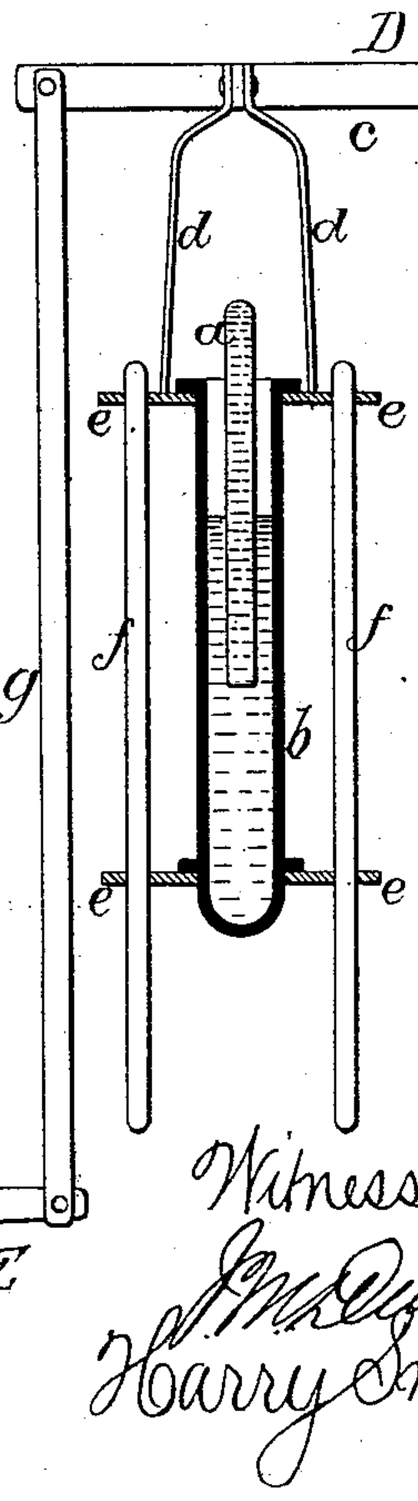


Fig. 3.

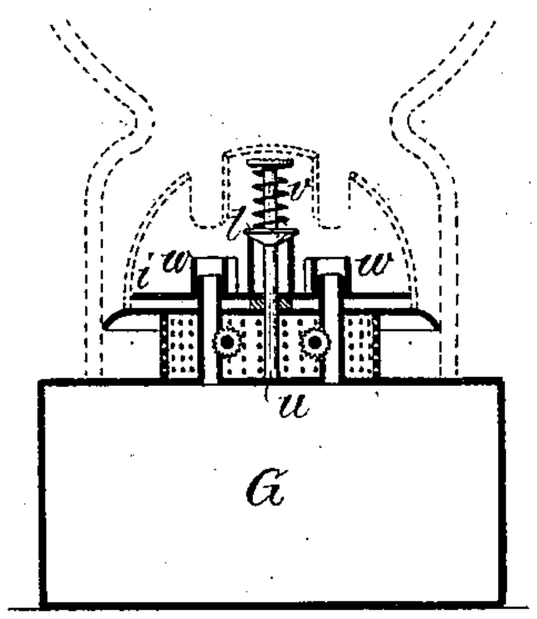


Fig. 4.

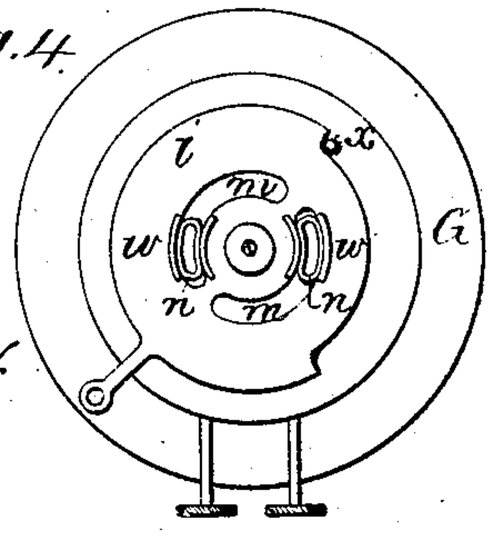
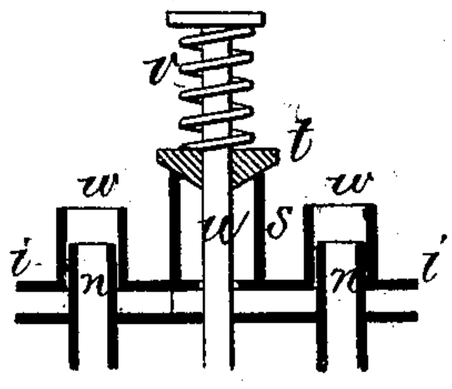


Fig. 5.



Witnesses
J. W. Quinn.
Harry Smith

Inventor
Henry B. Tatham Jr
by his Attorneys
Howson & Son.

UNITED STATES PATENT OFFICE.

HENRY B. TATHAM, JR., OF PHILADELPHIA, PENNSYLVANIA.

HEAT-REGULATING DEVICE FOR INCUBATORS.

SPECIFICATION forming part of Letters Patent No. 226,568, dated April 13, 1880.

Application filed September 10, 1879.

To all whom it may concern:

Be it known that I, HENRY B. TATHAM, JR., of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Heat-Regulating Devices for Incubators, &c., of which the following is a specification.

The object of my invention is to provide a simple and effective device for regulating the temperature of incubators, greenhouses, or apartments generally in which it is desired to maintain a uniform temperature; and this object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of an incubator with my improved regulating device; Fig. 2, a detached view of part of the same; Fig. 3, a vertical section of the lamp or heater; Fig. 4, a plan view of Fig. 3; and Fig. 5 a sectional view of part of Fig. 3 drawn to an enlarged scale.

In the present instance I have shown my invention as applied to an incubator similar to that described in my Patent No. 220,191, dated September 30, 1879, A being the box or casing of the incubator, and B the water-heating coil. It should be understood, however, that the invention is not restricted to incubators, but can be used in connection with any structure in which a uniform temperature is desired.

Projecting from one side of the box A is a tube, *a*, which is bent abruptly downward, the tube being open at the end and its vertical portion being contained within a cup, *b*, the diameter of which is such that there will be a space around the tube *a*.

The cup *b* is suspended by links *d* from one arm, *c*, of a lever, D, the opposite arm, *c'*, of which is weighted, and suitable wings or flanges *e* on the cup *b* are adapted to vertical guide-rods *f*.

The arm *c* of the lever D is connected by a rod, *g*, to one arm of a bell-crank lever, E, hung to a pin on the box A, the other arm of said lever E being connected, by means of a rod, *h*, to an arm on a circular plate or disk, *i*, mounted upon the top plate of a lamp, G, the disk having slots *m*, for the reception of the wick-tubes *n*, and being furnished with segmental shields *w*, which extend above the tops of the wick-tubes, and, under the circumstances described hereinafter, embrace the wicks and reduce the size of the flame.

The disk *i* has a central tubular projection, *s*, and on the upper end of said projection bears a ring, *t*, the latter sliding on a pin, *u*, which projects from the top of the lamp and has an enlarged head, between which and the ring *t* intervenes a light spring, *v*. By this means the disk *i* is retained in proper position, but can be readily turned and can expand and contract freely without interfering with its proper operation.

The tube *a* is filled and the cup *b* partly filled with mercury or other liquid capable of expanding and contracting under the influence of varying degrees of temperature, the amount of liquid in the cup *b* being such that when the temperature within the box A is at the proper degree the weight of the cup and its contents on the arm *c* of the lever D will be overbalanced by the weight on the other arm, *c'*, of said lever, and the cup will occupy the elevated position shown in Figs. 1 and 2. Any increase of temperature within the box A, however, will cause the expansion of the liquid in the tube *a*, and a portion of this liquid will be forced into the cup *b*, thereby causing the weight on the arm *c* of the lever D to preponderate, so that the cup *b* will descend. As soon as the temperature within the box A is reduced the liquid in the tube *a* will contract, and a portion will be drawn from the cup *b* into the tube, so that the weighted arm *c'* of the lever will again preponderate and the cup will be elevated.

The manner in which the movements of the cup *b* govern the heating devices will be understood on reference to Figs. 1, 3, and 4.

When the cup is elevated the disk *i* occupies the position shown in Fig. 1, so that the wicks are free from the influence of the shields *w*, and each wick burns with a full volume of flame. When the heat becomes too great and the cup *b* descends, however, the bell-crank lever E is operated in such a manner as to cause a partial rotation of the disk *i*, so that the shields will embrace the wicks and lessen the volume of flame, the parts remaining in this position until the proper degree of tem-

perature is restored, when the cup *b* will rise and the disk *i* will be returned to its original position.

The edge of the disk *i* is recessed and acts, in conjunction with a stop-pin, *x*, on the lamp, so as to limit the movement of the disk in either direction.

When a lamp having a single burner is used a simple sliding plate having a shield may be substituted for the rotating disk *i*.

Heretofore in regulating apparatus based on the same principle as my invention the cup *b* has been stationary and the portion corresponding to the tube *a* has been connected to the weighted lever, a plan which was found to be objectionable, as in many cases—in incubators, fruit-driers, and greenhouses, for instance—it is important that the tube *a* shall always occupy a certain fixed position, while in other cases the space into which the tube must be fitted is so contracted that the movement of the tube is impossible. These objections are effectually overcome by the arrangement which I have adopted; moreover, the tube *a* can be made of any desired size and shape, an advantage not possessed by a regulator in which the tube is the movable portion.

Although I have described the controlling device as used in connection with a lamp, and although I prefer the lamp in most cases, on account of its convenience and cheapness, the movement of the lever D might be transmitted to a damper or register, or to a valve for controlling the flow of gas or steam through a pipe.

I claim as my invention—

1. The combination of the tube *a*, occupying a fixed position in a structure or apartment, and the cup *b*, inclosing the end of said tube *a* and hung to the weighted lever D, the weight on which counterbalances the weight of the cup, with devices whereby the degree of heat in said structure or apartment is controlled by the movements of the lever, all substantially as set forth.

2. The combination of the weighted lever and its cup *b*, the lamp G, the plate or disk *i*, having one or more shields, *w*, and connecting devices, substantially as described, whereby said plate or disk is operated in accordance with the movement of the lever, all as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

H. B. TATHAM, JR.

Witnesses:
ALEXANDER PATTERSON,
HARRY SMITH.