

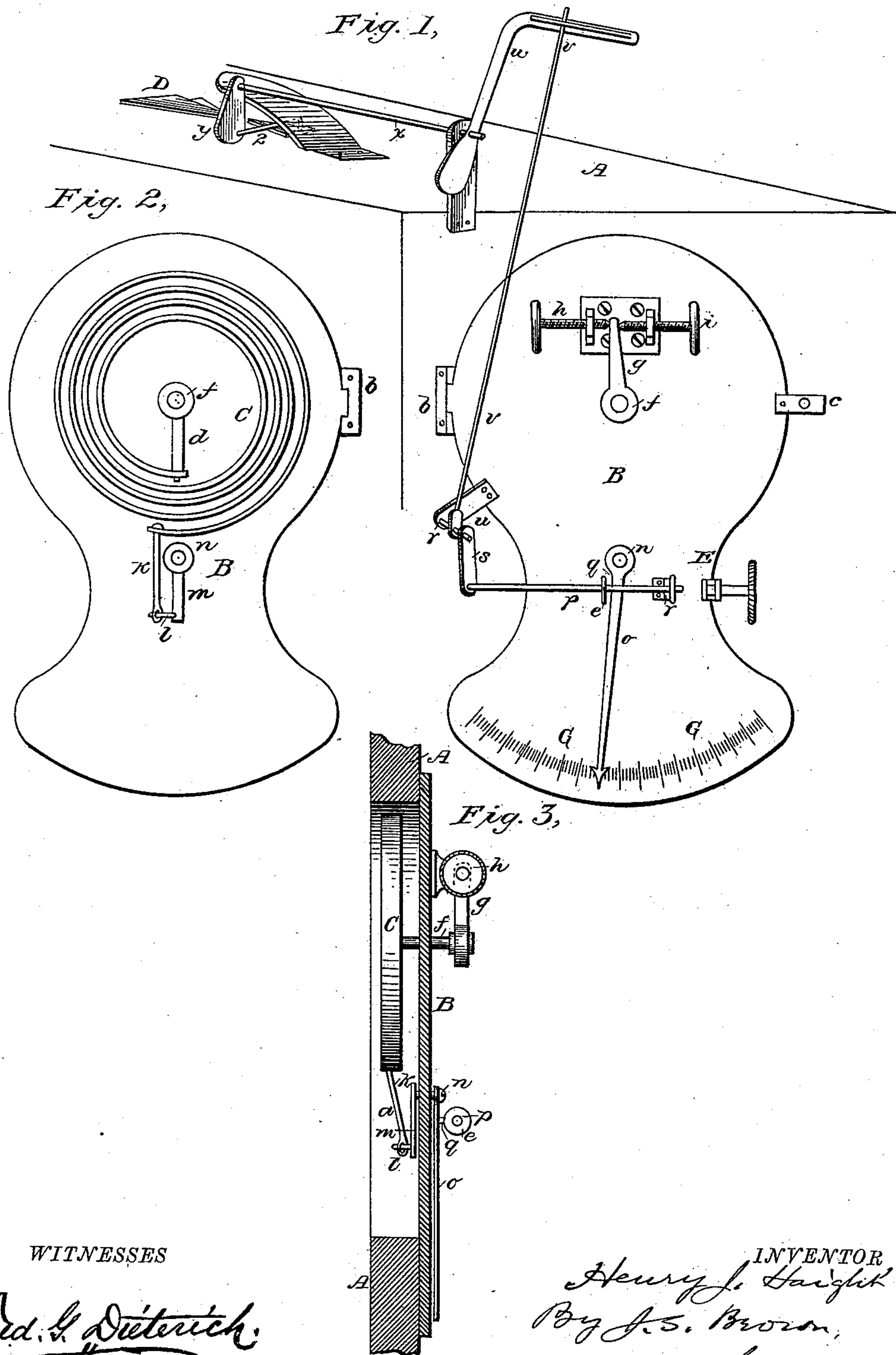
(No Model.)

H. J. HAIGHT.

THERMOSTAT.

No. 251,359.

Patented Dec. 27, 1881.



WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY J. HAIGHT, OF NEW YORK, N. Y.

THERMOSTAT.

SPECIFICATION forming part of Letters Patent No. 251,359, dated December 27, 1881.

Application filed June 6, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY JANSEN HAIGHT, of New York, in the county of New York and State of New York, have invented an Improved
5 Thermostat; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification—

Figure 1 being a view of the thermostat
10 in perspective, showing also the valve to the chamber, the heat in which is regulated thereby, and the connection between the valve and thermostat; Fig. 2, a back view of the thermostat; Fig. 3, a vertical section of the thermostat, showing also how it is applied in an
15 opening in the wall of the chamber.

Like letters designate corresponding parts in all of the figures.

The purpose of my invention is to regulate
20 the flow of air from a heated chamber, compartment, or room by the degree of temperature in the same, the regulation being effected by opening an air-exit valve more and more as the heat increases within, to let out more of
25 the heated air, and to partially or wholly close the valve when the temperature is sufficiently lowered within the chamber, by replacing the heated with cooler air.

My improved device for effecting this purpose is constructed substantially as follows:

Let A indicate a portion of any room, compartment, or chamber to which the thermostat is to be applied for regulating the temperature therein. An opening, *a*, of suitable size and
35 shape, is made in one of the walls of the chamber to receive the back part of the thermostat. A face-plate, B, is applied over and covers this aperture, and on this plate the parts composing the thermostat proper are
40 mounted. This plate may be mounted in place on a hinge, *b*, at one edge, and held closed over the opening by a button, *c*, or other suitable fastener. The main functional element of the thermostat is a coiled spring, C, which
45 expands and enlarges by heat and contracts by cold, the spiral form giving sufficient movement in a small space. This spring, of course, is to be applied on the inside of the plate, in order to subject it to the heat of the atmosphere inside of the chamber, and it is conveniently located and shielded in the aperture *a* of
50 the wall, as shown in Fig. 3. Its inner end is

attached to a radial arm, *d*, which is secured to the inner end of a short shaft, *f*, that extends outward through the plate C, and has
55 its bearing in a short tube or sleeve therein. To the outer end of this shaft, outside of the plate, is secured another radial arm, *g*, the outer or movable end of which is held between the points of two thumb-screws, *h i*, one pushing
60 the arm to the right and the other to the left. The adjustment of the arm *g* by this means, by rocking the shaft *f* on its axis, also adjusts the position of the inner fixed end of the coiled spring C and holds it firmly in its
65 adjusted position, and thus by partially coiling or uncoiling the spring it determines the degree of heat retained in the chamber by the action of the thermostat on the valve D, connected therewith. The outer movable end of
70 the spring C has a projecting finger or rod, *k*, which is provided with a slot or eye, that goes over or embraces a pin or projection, *l*, on a radial arm, *m*, the shaft *n* of which extends out through and has its bearing in the plate
75 B, and to the outer end of this shaft is secured an arm or index, *o*, through which the vibratory movements of the shaft *n*, caused by the contraction and expansion of the coiled spring, are communicated to the valve D.
80

The means by which the motion communicated to the index-arm *o* is transmitted to the valve is substantially as follows: A sliding rod, *p*, is held at one end in a bearing, *r*, of the plate B, while the other end is pivoted to
85 an arm, *s*, on a rock-shaft, *t*, suitably supported by the plate B, or a projection therefrom, as shown. Another arm, *u*, on this rock-shaft has a connecting-rod, *v*, the other end of which plays in a slotted arm of a counterweighted
90 lever, *w*, on a rock-shaft, *x*, which bears another weighted arm, *y*, from which a connecting-rod, *z*, extends to the valve itself. A pin, *q*, on the index-arm *o* strikes a stop, *e*, on the sliding rod *p*, the position of which stop is such
95 that the pin *q* reaches it when the heat in the chamber begins to exceed the limit desired, or to which the instrument is adjusted, and begins to move the valve D through the connections above described.
100

A stop, E, situated in the line of the sliding rod *p*, is secured on the end of an adjusting-screw with a milled head, and turning in a stationary nut on the plate B. This stop limits

the retracting distance which the sliding rod *p* is to move, and it is adjustable to suit the fixed temperature to which the instrument is adjusted to keep the chamber heated up.

5 An index, *G*, on the plate *B*, adapted to the index-arm *o*, and properly numbered, serves to indicate to the eye the temperature to which the instrument is set or to be set. The counter-weights on the lever *w* and arm *y* are intended to assist the index-arm *o* in operating the valve, being adjusted to balance all the connected parts in the best way to make the movement of the valve easy in both directions. They may a little underbalance, so that the sliding rod *p* will recede by the gravity of the connected parts when the index-arm is retracted by the action of the spring *C*; or the said sliding rod may be coupled to the index-arm, so that the latter really moves it in both directions.

20 I have used this thermostat for regulating the heat in artificial incubators, and the arrangement above described is such as I have adapted to that special use; but it is obvious that it is adapted to other analogous uses, such as regulating the heat in the rooms of dwelling-houses, &c., only such modifications of the apparatus described being required as will properly fit it to its situation in each case. Yet it is also obvious that unimportant variations from the particular construction represented may be made at will, provided the principles of the action of the apparatus are retained. Also, this thermostat is equally applicable to the regulation of hot or cold air flowing into a room or chamber, the valve and valve-connection therewith being arranged to suit the purpose, as any one skilled in the art will readily understand.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The actuating coiled spring *C*, secured at one end to an arm, *d*, on a rock-shaft, *f*, the shaft being provided with another arm, *g*, adjustable by screws *h i*, for adjustably determining the required temperature at which the chamber or room is to be kept, substantially as and for the purpose herein specified.

2. In combination with the movable end of the actuating coiled spring *C*, an arm, *m*, connected therewith and secured to a rock-shaft, *n*, which bears a motion-transmitting arm, *o*, substantially as and for the purpose herein specified.

3. The combination of the coiled spring or strip *C*, arm *m*, rock-shaft *n*, arm *o*, sliding rod *p*, valve *D*, and connecting mechanism between the rod *p* and the valve, substantially as and for the purpose herein specified.

4. The adjustable stop *E*, in combination with the sliding rod *p* and arm *o*, substantially as and for the purpose herein specified.

5. In combination with the arm *o*, constructed also to act as a pointer, and the adjustable stop *E*, the index or graduated scale *G*, for the purpose of determining to what degree the said stop is adjusted, as well as of indicating the degree of temperature at any time in the chamber, substantially as herein specified.

The foregoing specification signed by me this 14th day of May, 1881.

HENRY JANSEN HAIGHT.

Witnesses:

C. S. NEWELL,
JOS. A. STORKEN.