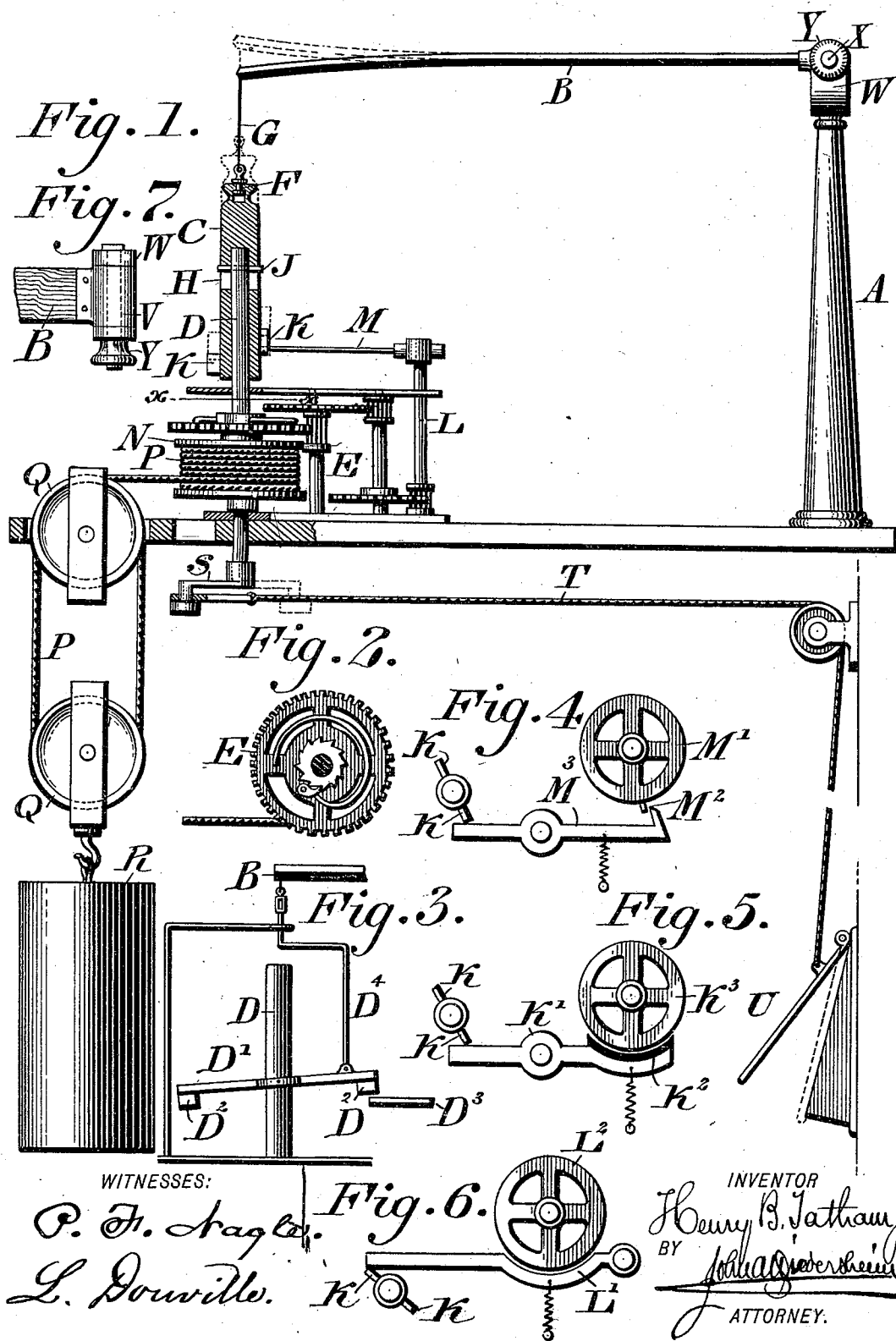


(No Model.)

H. B. TATHAM, Jr.
TEMPERATURE CONTROLLING DEVICE.

No. 511,283.

Patented Dec. 19, 1893.



UNITED STATES PATENT OFFICE.

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

TEMPERATURE-CONTROLLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 511,283, dated December 19, 1893.

Application filed December 6, 1892. Serial No. 454,255. (No model.)

To all whom it may concern:

Be it known that I, HENRY B. TATHAM, Jr., a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Temperature-Controlling Devices, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a device for controlling the temperature of buildings, apartments, or apparatus in a delicate and powerful manner, the same being composed of mechanism connected with a damper, ventilator, valve, &c., and adapted to become operative by the action of a thermostat, in a manner as will be hereinafter set forth.

Figure 1 represents a partial side elevation and partial vertical section of a temperature-controlling device embodying my invention. Fig. 2 represents a horizontal section of a portion on line *x, x*, Fig. 1. Fig. 3 represents a side elevation of a portion of a modification. Figs. 4, 5 and 6 represent top or plan views of portions of modifications. Fig. 7 represents a top view of one end of the thermostat and the adjustment thereof.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings:—A designates a standard with which is connected one end of a thermostat B, whose other end has attached to it the pendant C, which is telescopically fitted on the shaft D of a train E of clock gearing, so as to be adapted to be raised and lowered on said shaft, said pendant having a swiveled connection F with the cord, wire or rod G which is secured to the thermostat. In the pendant is a transversely extending slot H, and on the shaft D is a pin J, which enters said slot, whereby the motion of the shaft may be communicated to the pendant. Projecting from the pendant are lugs K, one of which is located above the other, as most clearly shown in Fig. 1.

L designates a reduced power shaft which carries a gear wheel which meshes with a proper wheel of the train E, so as to be rotated by the same, said shaft having secured to it the arm M, which is adapted to engage with either of the lugs K, as will be hereinafter more fully described.

On the shaft D is a drum N, around which is wound the cord P, the latter passing around the pulleys Q from the lower one of which depends the weight R, whereby the train may be set in motion, and the shaft D and the pendant C receive motion controlled at times, however, by the lugs K and arm M.

Connected with the shaft D is a crank arm S, to which is attached one end of the cord or chain T, whose other end is connected with the damper U, or in lieu thereof with a ventilator, valve, lamp, &c., said crank being also adapted to wind the cord P on the drum N, for raising the weight R for the operation of the train E.

Any form of thermostat of suitable construction is adapted to control the pendant C, but the form I most prefer under all ordinary circumstances is a compound bar of wood and hard rubber, as shown in Fig. 1.

In lieu of the crank S there may be substituted a valve, or a three-way valve, controlling steam, air or liquids under pressure, and leading to floats, reservoirs or diaphragm valves connected with the apparatus to be controlled.

The operation is as follows:—When the temperature of the apartment, &c., rises, the thermostat lifts the pendant, whereby the upper lug K clears the arm M. As the latter is released, the train is set in motion, and the pendant rotates. The arm M also rotates, owing to the shaft L, and the lower lug K is so disposed that it is in the path of said arm, whereby the latter is controlled, and the train is stopped. It will here be observed that the reduced power transmitted by the gearing to the bar M permits the bar M to bear but very lightly on the lugs K, K, offering but very slight resistance to the movement of the thermostat under the variations of temperature, while the full power of the weight or spring is exerted on the main shaft controlling the dampers or valves. It will be seen that the crank arm S has changed its position, as illustrated by dotted lines. This relieves the cord T, which permits the damper U to lower, and consequently close, the effect of which on the furnace or fire is evident. In due course of time, the temperature of the apartment will be lowered or reduced. Consequently the thermostat contracts, and the pendant C lowers,

whereby the lug previously engaged with the arm M, clears said arm, and the train is again set in motion. When the other lug reaches the arm M, the latter having been rotated by the train, said arm is stopped, whereby motion of the train ceases. The crank arm S has now assumed the position shown in full lines in Fig. 1, whereby the cord T is drawn up, and the damper U accordingly raised and opened, the effect of which on the furnace or fire, is evident, and so the operations of closing and opening the damper are continued, as the temperature of the apartment varies.

In order to adjust the thermostat, the end of the same on the standard A has an eye V secured to it, the same being connected with and mounted on ears W by means of a screw X, which is passed through said eye and ears, and adapted to be tightened by a nut Y.

In Fig. 4, the arm M is substituted by a wheel or disk M', being secured to the shaft L, the same having a pin projecting therefrom for engagement with the head of the arm M³ which is properly pivoted on the frame, and having a spring to withdraw it from the disk when the opposite end is not engaged with the lugs K, K, with which it is adapted to become engaged, the end of said arm being adapted to be engaged by either of the lugs K of the pendant.

In Fig. 5, I show an arm K' having a head K² adapted to engage with a wheel K³ by frictional contact.

In Fig. 6, I show an arm having a portion L' adapted to contact with a wheel L², the arms in Figs. 5 and 6 being adapted to be engaged by the lugs K, similar to Fig. 4.

In Fig. 3, I show a locking arm or lug D' mounted on the shaft D, and having projections D² on the ends thereof for engagement with an arm or lug D³ which is similar to the arm M. The arm D' is connected with the thermostat by means of an arm D⁴, the same being swiveled at the top and rotating with the arm or lug D', when the latter receives motion from the shaft D, due to the operation of the train E, the result in each case being similar.

In lieu of the weight R, the cord P and pulleys Q, I may use as a motive power, a spring which may be wound up on the barrel N, as in clock-work, but to either form as the motor, I do not limit myself.

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

1. The combination in a heat regulator of a shaft for operating a crank or valve, a motor operating said shaft, movable lugs connected with and turning with said shaft, a train of gearing from said shaft to a reduced power shaft, and an arm or lever connection from said reduced power shaft to said lugs, whereby the movement of said shaft is con-

trolled by a thermostat, substantially as described.

2. The combination with a thermostat, of lugs pendent from said thermostat, a main power shaft connected with said lugs, a reduced power shaft geared with said main power shaft, and having means substantially as described connected therewith and adapted to contact with said lugs, a crank-arm attached to the main power shaft, and a connection for said crank with a damper, substantially as described.

3. The combination with a thermostat of an arm or lug, turning with a main power shaft connected with said arm or lug, a reduced power shaft geared with the said main power shaft, and having an arm, lever or wheel movably connected with said lugs, enabling said power shaft to be released and engaged by said arm, lever or wheel, a crank arm or valve attached to the main power shaft, and a connection from the same with a damper, ventilator or valve, and a suitable weight, spring or mechanism to actuate the same, substantially as described.

4. A heat regulator consisting of a thermostat having means at one end for adjustably securing it to a standard, and a pendant connected with the other end, a rotatable shaft on which said pendant is telescopically fitted, a drum secured on said shaft, means connected with said drum for rotating the same, a train of gearing connected with said shaft, and having an arm adapted to engage lugs on said pendant, and means connecting said shaft with a damper, said pendant being rotatably connected with said shaft, said parts being combined substantially as described.

5. A heat regulator consisting of a thermostat, a pendant secured to one end of said thermostat, a rotatable shaft on which said pendant moves, lugs on said pendant, a train of gearing operating said shaft, a reduced powershaft having a wheel meshing with said train, and an arm adapted to engage any of said lugs, and means for connecting said rotatable shaft with a damper, said parts being combined substantially as described.

6. A heat regulator having a thermostat with one end adjustably secured to a standard, a pendant swiveled to the other end thereof, and having lugs thereon, a rotatable shaft, a reducing train of gearing connected with said shaft and having an arm engaging said lugs, and means for connecting said shaft with a damper, said pendant being telescopically mounted on said shaft and rotating therewith, said parts being combined substantially as described.

HENRY B. TATHAM, JR.

Witnesses:

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