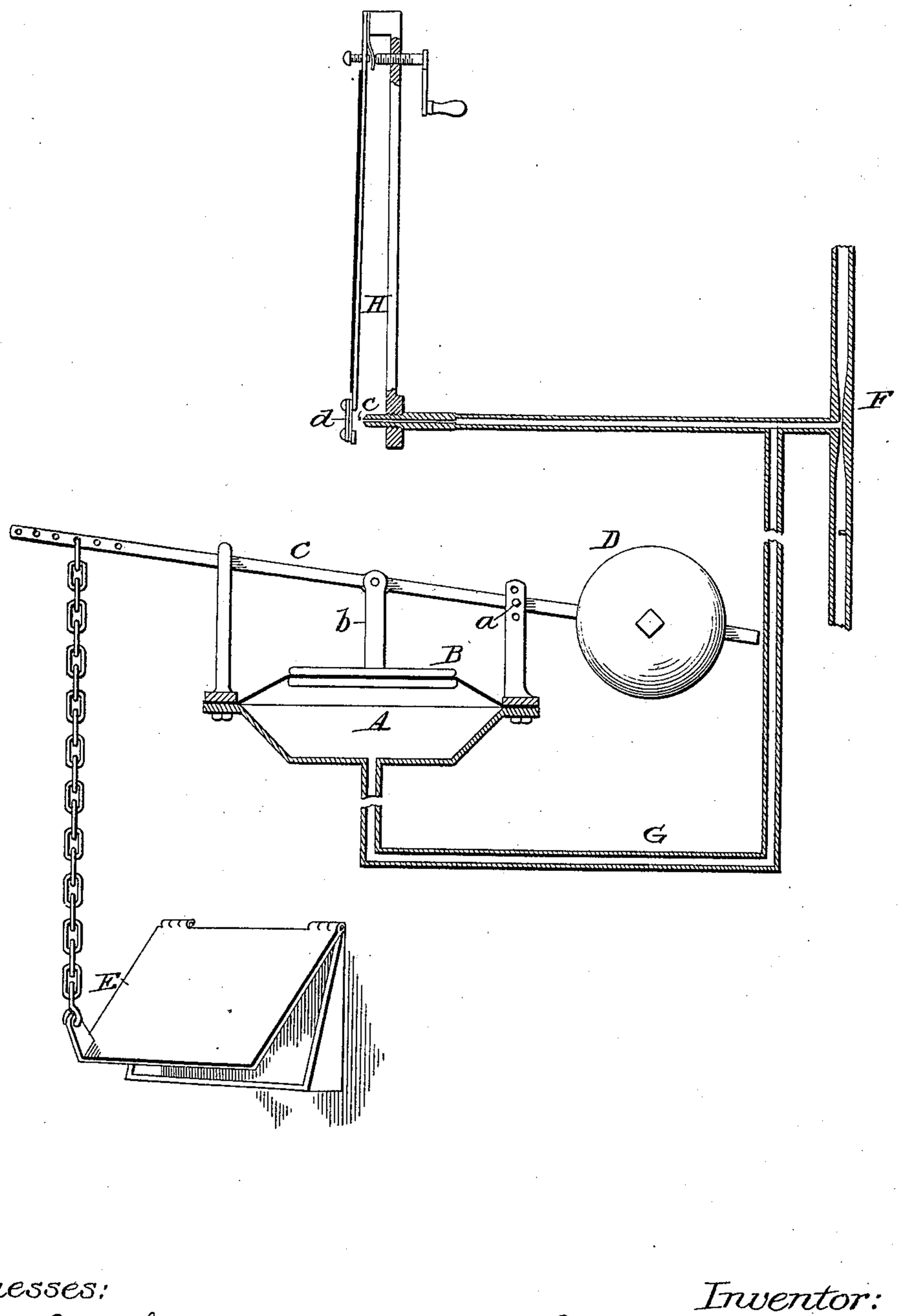
(No Model.)

L. F. EASTON.

TEMPERATURE REGULATOR.

No. 400,758. Patented Apr. 2, 1889.



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UNITED STATES PATENT OFFICE.

LUCIEN F. EASTON, OF LA CROSSE, WISCONSIN.

TEMPERATURE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 400,758, dated April 2, 1889.

Application filed December 26, 1888. Serial No. 294,610. (No model.)

To all whom it may concern:

Be it known that I, LUCIEN F. EASTON, of La Crosse, in the county of La Crosse and State of Wisconsin, have invented certain new and useful Improvements in Temperature-Regulators, of which the following is a specification.

My invention relates to apparatus for regulating temperature; and it consists in the combination of an expansible and contractible chamber, a draft, damper, valve, or other device for controlling temperature, connected with a movable part of said chamber, an aspirator or pump communicating with said chamber, and a thermostatic valve serving to open or close an air-opening communicating with an aspirator, and thereby to cause said apparatus to act or to cease acting to expand or contract the chamber, as required.

The drawing illustrates my invention embodied in a simple form, one of many in which it may be embodied, and acting by exhaust.

A indicates an expansible and contractible chamber, one wall of which is represented in the form of a flexible diaphragm, B. For this construction may be substituted, however, a telescopic or a bellows-like chamber or vessel, or a chamber having a sliding piston instead of the diaphragm, these being well-known equivalents for the purpose.

C indicates a lever pivoted at *a*, and furnished in rear of said pivot with a counterweight, D, which tends to depress that end of the lever to which it is applied and to lift the opposite end, which latter is connected in any convenient manner with a draft-door, E, or with a valve, damper, window, or other device to be actuated. The lever C is connected by a stem, *b*, with the diaphragm B at the opposite side of pivot *a* from that on which weight D is placed, so that as the weight falls it lifts one arm of the lever, and with it the diaphragm B and the draft-door E.

F indicates an aspirator or exhausting device in which a stream of water, gas, or other fluid is employed to produce the necessary suction or exhaustion, such devices being well known and in common use. The aspirator F communicates by means of a pipe, G, with chamber A and serves to exhaust the air therefrom when the pipe G is closed to the external atmosphere. When the air is exhausted from chamber A, the diaphragm B is depressed by the pressure of the atmosphere upon it, and the draft-door E is lowered and closed, thus checking the fire and lowering the temperature. It is obvious, however, that instead of closing the diaphragm beneath the fire it may operate a check above the fire, or the parts may be so arranged as to open a draft below or throw off a check above the fire when the temperature falls too low. This will depend upon the manner of applying the thermostat which controls the operation of the apparatus in a manner that will now be explained.

The pipe G, or it may be the shell of chamber A, is furnished with an air-inlet, *c*, which is normally open; but which, when the temperature reaches a predetermined point, is closed by a valve, *d*, carried by a thermostat, H.

The form and character of the thermostat may vary, though I prefer a compound bar of hard rubber and brass, or of other solids having different rates of expansibility, and which will bend in one or the other direction as the temperature rises or falls.

In the drawings I have shown the thermostat H with the valve *d* applied to its brass side, so that upon rise of temperature the valve shall be seated over the mouth of inlet *c*, and thereby caused to close the pipe G against the external atmosphere. From this explanation it will be apparent that whenever the temperature reaches a point to which the thermostat is adjusted the air-inlet *c* will be closed and the aspirator F, drawing air from chamber A, will cause the descent of the diaphragm B and the lever C, and the consequent closing of the draft or damper. When the temperature falls sufficiently to affect the thermostat, it bends and carries valve *d* away from inlet *c*, opening said inlet permitting air to enter pipe G, and thereby destroying the vacuum in said pipe and in chamber A, whereupon the weight D will raise lever C, diaphragm B, and draft-door E. In this way the temperature of the apartment in which the thermostat is placed can be accurately regulated and maintained.

A series of rooms may be provided with

thermostats, each arranged to close an air-inlet to said pipe G, so that until each room attains the temperature to which its thermostat is adjusted the draft-door will not be affected.

It is manifest that the same construction and arrangement of parts may be made use of with compressed air, the lever C, if used, being in such case made to work in an opposite way to that indicated, which can be done by connecting the diaphragm therewith at the opposite side of its pivot. The lever mechanism is not essential, however, but the diaphragm, piston, or movable part of the chamber may be directly connected with the draft, damper, valve, or part to be actuated and controlled.

In practice I prefer to employ the aspirator, whether for exhausting or compressing air, the only change required being the attachment of pipe G to the air-inlet when using it for exhausting, and below said inlet when for compressing, as is well understood. Manifestly, however, any form of suction or compression apparatus may be employed. So, too, I prefer exhaustion to compression, because an unsafe pressure cannot be attained, and corrosion is prevented because of the evaporation of moisture in the rarefied medium.

Having thus described my invention, what I claim is—

1. The combination of a valve, damper, or analogous device, an expansible and contractible chamber having a movable part arranged to actuate said valve, damper, or device, a pumping apparatus communicating with the chamber, and a thermally-controlled valve serving to open and close communication between the pump and the external atmosphere at a point between the pump and the chamber, substantially as and for the purpose specified.

2. The combination of a valve, damper, or analogous device, an expansible and contractible chamber having a movable part arranged to actuate said valve, damper, or other device, an exhausting apparatus serving to exhaust air from the chamber, and a thermally-controlled air-inlet serving to admit air to the chamber or to the exhaust system at any point.

3. The combination of chamber A, movable wall B, lever C, weight D, valve or damper E, aspirator F, pipe G, provided with inlet *c*, and thermostat H, provided with valve *d*, said parts being constructed and arranged to operate substantially as set forth.

In witness whereof I hereunto set my hand in the presence of two witnesses.

LUCIEN F. EASTON.

Witnesses:
WALTER S. DODGE,
WILLIAM W. DODGE.