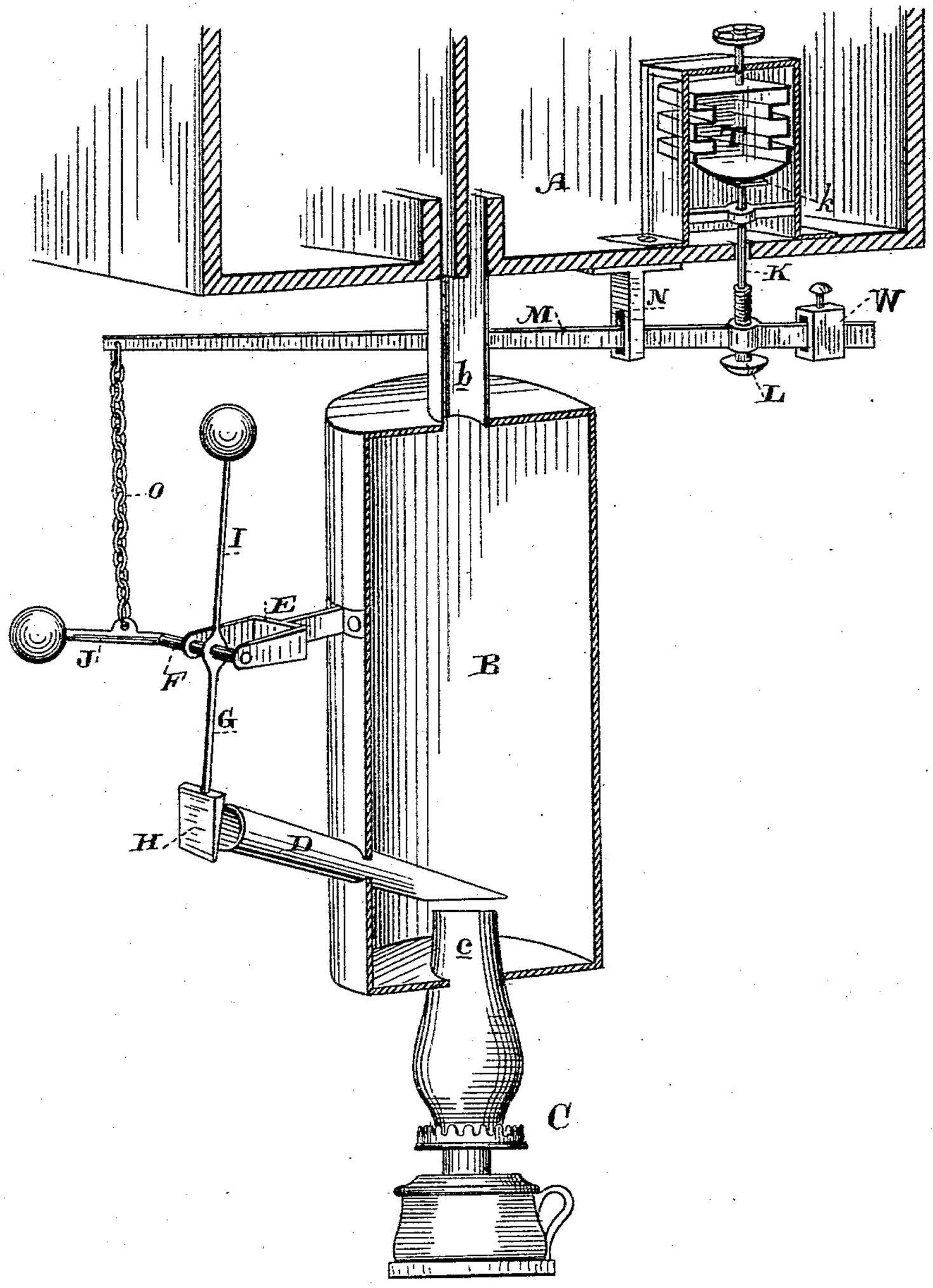
(No Model.)

L. C. BYCE & I. L. DIAS.

A. DIAS, administratrix of I. L. DIAS, deceased.

HEAT REGULATOR.

No. 319,064. Patented June 2, 1885.



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UNITED STATES PATENT OFFICE.

LYMAN C. BYCE AND ALZINA DIAS, (ADMINISTRATRIX OF ISAAC L. DIAS, DECEASED,) OF PETALUMA, CALIFORNIA.

HEAT-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 319,064, dated June 2, 1885.

Application filed February 9, 1885. (No model.)

To all whom it may concern:

Be it known that I, LYMAN C. BYCE, of Petaluma, county of Sonoma, and State of California, and ISAAC L. DIAS, late a resident of Petaluma aforesaid, (deceased,) did in the lifetime of said ISAAC L. DIAS, and in conjunction with him, invent an Improvement in Heat-Regulators, of which the following is a specification.

This invention relates to that class of heat-regulators in which an expanding and contracting substance is caused through intermediate mechanism to govern or control the source of heat, whereby the temperature of an apartment may be kept at a certain degree; and this invention consists in a novel channel or passage in connection with the heat source and adapted to divert the heat when necessary, a valve adapted to close said passage or channel when the heat is not to be diverted and to open it when otherwise, and in a peculiar valve-operating mechanism affected by an expanding and contracting substance, thermostat, or regulator within the apartment, all of which shall be hereinafter fully explained.

This invention further consists in the application and location of these parts in connection with an incubator, whereby certain beneficial results are effected, as shall be described.

The object of this invention is to provide a simple and effective heat-regulating device, which, though applicable to any apartment, is specially applicable to an incubator.

Referring to the accompanying drawing, the figure is a sectional perspective of the heat-regulator.

A is the apartment which may here be considered as the egg-chamber of an incubator. B is a cylinder, the upper end of which communicates through a passage, *b*, with the egg-chamber. C is the lamp, (or other source of heat,) having a vent or chimney, *c*, which extends within the cylinder B. The heat from the lamp passing upward through cylinder B and passage *b* enters the egg-chamber.

Supported in the side of the cylinder B, and projecting within and without, is a pipe or passage, D, the inner end of which is supported a short distance above, though without touching the top of the lamp-chimney *c*. A space is thus left through which the heat escapes into the cylinder, taking its usual course. This is only the case, however, when the pipe or passage D is closed, for when it is open throughout the heat is diverted from the cylinder and passes directly through the pipe D.

Mounted on the side of the cylinder B is a bracket, E, in the arms of which is journaled a rock-shaft, F. From this shaft extends downwardly an arm, G, the lower end of which carries a valve-plate, H, which is adapted to close or open the end of pipe D. Extending upwardly from the shaft is a balance-weight arm, I, and from the end of the shaft and approximately at right angles with the other arms extends a weight arm or crank, J.

Within the egg-chamber is the thermostat T, a particular description of which is not herein necessary, as its construction forms no part of this application. It will be sufficient to say, therefore, it consists of one or more casings of thin metal filled with a liquid or fluid adapted to expand under the influence of heat, whereby the bottom of the casing is bulged out or allowed to return to its natural position. Under the bottom of the thermostat, though not connected with it, is a small contact-plate, *k*, on top of a rod, K, which passes down through the egg-chamber and is fitted in the top of an adjusting-screw, L, set in a long lever, M. This lever is pivoted to a hanger, N, and has on one end an adjustable weight, W. Its other end is connected by means of a chain, O, with the crank-arm J of the rock-shaft.

The operation is as follows: The devices are so regulated that up to a certain degree of heat the weight of the long arm of lever M, the chain O, and the weighted crank-arm J is sufficient to hold the valve H against the pipe D, whereby said pipe is closed and the heat passes through the space between the inner end of the pipe and the top of the lamp-chimney into the cylinder B and upward into the egg-chamber; but above that temperature the expansion of the thermostat is sufficient to bear down upon the plate *k*, whereby, through rod K, lever M, and chain O, the crank-arm J is raised, thus rocking the shaft F and causing the valve H to move away from and open pipe

D. The heat finding a readier means of escape passes through said pipe, and is thus diverted from the cylinder B. When the temperature in the egg-chamber has fallen, the contraction of the thermostat allows the valve to return to its position. By the movement of the screw L and weight W the various parts may be accurately adjusted to cause them to act at any given degree of temperature.

The particular advantage which the application of this device to an incubator gives, is that the diversion of the heat takes place at or near the source of heat. When the heat is cut off in the immediate neighborhood of the egg-chamber, the adjacent parts continue to be heated, and the fall in temperature is not as immediate as may be desired; but in this case what small radiation may take place from the pipe D is of no consequence, being so far removed from the egg-chamber, and therefore the upper part of the cylinder and the intervening passage cool as rapidly as the egg-chamber. Then again, it has been customary in cutting off the heat to provide no means for its escape, and when the passage is reopened it rushes in again; but here it is diverted into the open air at once and has no quantity stored up to immediately overheat the chamber again.

Having thus described this invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. The combination, with an apartment, a heating device, and a pipe or passage, D, extending from above and near the source of heat to the open air, of a valve and a suitable thermostat or regulator in the apartment, and connections between the thermostat and the valve, whereby the heat may be diverted through said pipe or allowed to pass by it into the apartment, substantially as herein described.

2. A heat-regulating device, consisting of the vessel B, the pipe or passage D, leading from above and near the source of heat to the open air, and the valve H, adapted to open or close the end of the pipe, in combination with the rock-shaft F, having valve-arm G and crank-arm J, a suitable thermostat or regulator, and a connection between said thermostat and the crank-arm, whereby the shaft F is rocked and the valve operated, substantially as and for the purpose herein described.

3. A heat-regulating device, consisting of the vessel B, pipe or passage D, in approximate relation with the source of heat, the rock-shaft F, having valve-arm G, the valve H, adapted to open and close the pipe for the purpose described, and the crank-arm J, in combination with a thermostat or regulator provided with the expansion-chamber, the contact-plate *k* thereunder, having rod K, the pivoted weighted lever M, to which the rod is joined, and the chain O, by which the lever and crank-arm J are connected, all arranged and adapted to operate substantially as and for the purpose set forth.

4. The apartment A, heat-cylinder passage or vessel B *b*, and the lamp C in the bottom of the passage, and having chimney or vent *c*, in combination with the pipe or passsage D, supported just over the chimney or vent and projecting without the cylinder B, the valve H, and a suitable thermostat or regulator within the apartment to open or close the pipe D, and connections between the valve and thermostat, whereby the heat is diverted into the open air or allowed to pass up through the passage B *b* into the apartment, substantially as herein described.

5. The apartment A, having a thermostat or regulator, T, within it, the heat-cylinder passage or vessel B *b*, and the lamp C or other scource of heat in the bottom of the passage and having a chimney or vent, *c*, in combination with the pipe or passage D, supported just over the chimney or vent and projecting without the cylinder B, the valve H, adapted to open or close the outer end of pipe D, the rock-shaft F, mounted on the side of the cylinder and having valve-arm G and crank-arm J, the pivoted swinging lever M, and chain O, connecting it with crank-arm J, and the rod K on the lever M, passing up into the apartment and having a contact-plate, *k*, under the thermostat or regulator, substantially as and for the purpose herein described.

Signed in the presence of two subscribing witnesses.

LYMAN C. BYCE.
ALZINA DIAS,
Administratrix of the estate of Isaac L. Dias, deceased.

In presence of—
WM. B. HASKELL,
M. H. FALKNER.