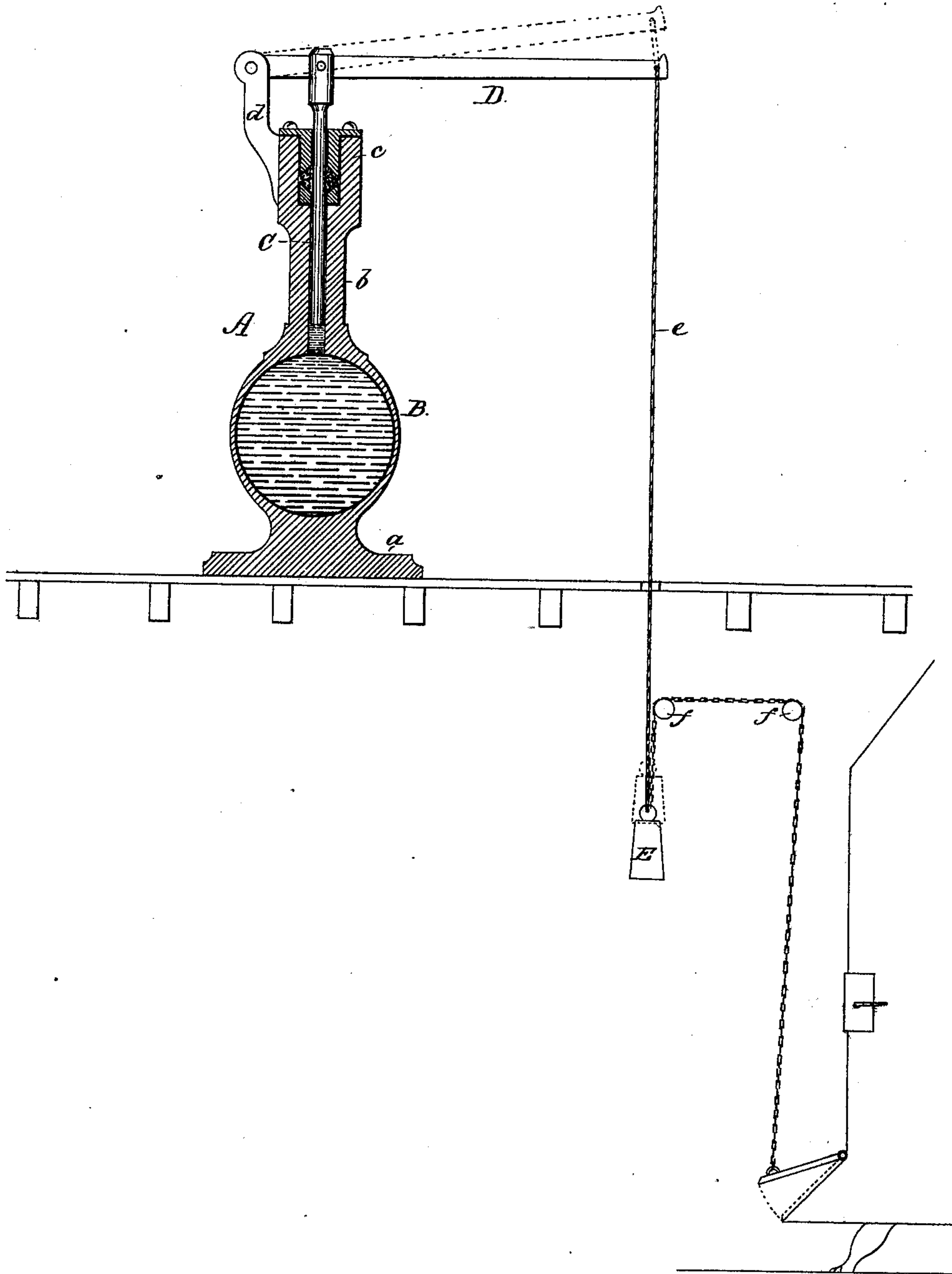


E. S. GARY.  
Heat Regulator.

No. 214,122.

Patented April 8, 1879.



WITNESSES:

*W. W. Hollingsworth*

*Edw. W. Byrnes*

INVENTOR:

*E. Stanley Gary*

BY

*Robert L. Gary*

ATTORNEYS.

# UNITED STATES PATENT OFFICE.

EDWARD S. GARY, OF BALTIMORE, MARYLAND.

## IMPROVEMENT IN HEAT-REGULATORS.

Specification forming part of Letters Patent No. **214,122**, dated April 8, 1879; application filed February 20, 1879.

*To all whom it may concern:*

Be it known that I, EDWARD STANLEY GARY, of Baltimore city, State of Maryland, have invented a new and Improved Heat-Regulator; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which the figure is a vertical section, showing the device applied in connection with a furnace, the latter being shown in outline simply and on a reduced scale, so as to come within the limits of the drawing.

The object of my invention is to provide a simple device for regulating automatically the heat in an apartment, or the flow of heat to an apartment, so as to preserve a uniform temperature therein and prevent the wasteful use of fuel.

My invention proceeds upon the general principle of utilizing the expansion and contraction of a fluid from variations of temperature, for the purpose of producing a mechanical movement that shall control the draft or hot-air dampers, so as to secure the desired result.

The invention consists of a thin metallic receptacle filled with oil or other liquid easily expanded by heat, which receptacle is contracted and extended at the top in the form of a neck, which is bored smoothly to receive a piston, and which neck terminates in a stuffing-box. To the piston-rod of the piston is attached a lever, and this affords means for multiplying the movement of the piston from the expansion and contraction of the fluid, so that a wire connecting said lever with the draft or hot-air dampers of the furnace or stove furnishes the necessary connection for controlling the combustion or regulating the flow of hot air.

In the drawing, A represents the device which is designed to be located in the apartment whose temperature is to be regulated, and which, for this purpose, may be arranged in one corner of the room in a niche or recess of the wall, like a gas-meter. The device, however, may be located in any other desired position in the room, or be placed wholly in the cellar in such relation to the furnace as to be affected by the heat to produce the same

result. It is made of different sizes, according to the capacity of the space to be regulated; but, for most purposes, it consists of a thin globular metallic receptacle, B, of about four inches diameter, cast or formed with a supporting-base, *a*, and with its upper end contracted and extended in the form of a neck, *b*, terminating in a stuffing-box, *c*. These parts are preferably cast all in one piece, the receptacle B being cored out and the neck smoothly bored, so as to receive a tightly-fitting piston.

C is said piston, which is made of small transverse area, so as to get as much movement as possible from a given expansion of the fluid contained in the receptacle. Through the stuffing-box the piston-rod projects, and is pivoted to a lever, D, fulcrumed upon an offsetting support, *d*, cast upon the side of the stuffing-box. Now, it will be seen that as the temperature of the air surrounding the device rises the oil or other liquid is expansively affected through the thin metal of the receptacle, and the piston and its attached lever are raised.

For connecting this lever and imparting its movement to the doors or dampers of the furnace in the cellar, I extend a wire or cord, *e*, down to the same. To secure the best action said door should preferably be of the form shown—*i. e.*, hinged at the top—so as to close from gravity. The connection may be made, however, with any of the ordinary forms of doors or dampers, whether they be for regulating the supply of air to the furnace, as shown, or for regulating the discharge of hot air from the furnace.

As the positive action of the device A from the expansion is a lifting action which takes place from too great a heat, some means must be provided for reversing this action, so as to cause the rise of the lever to close the draft-doors of the furnace or discharge-dampers of the hot-air flues. For this purpose I employ pulleys *f f* and a weight, E, attached to the cord or wire, so that when the lever of the device descends from the cooling down of the apartment the weight opens the furnace-draft and increases the combustion by admitting a greater supply of air. Other means besides this, however, may be devised to accomplish



the same result; and in some cases the lifting action of the lever may, by a direct connection, be made to open the furnace-door above the fire to reduce the heat.

Instead of using the lever for transmitting the movement of the piston, any of its equivalent mechanical devices may be employed.

In defining my invention more clearly I would state that I am aware that in steam-heating devices the doors of the furnace have been connected to and operated by a lever and piston, which latter was actuated by the direct pressure of the steam. This, it will be seen, does not reach the result at which I aim, for the reason that the regulation of the furnace is not made dependent upon the actual temperature of the rooms to which the occupants are subjected, but is dependent upon the steam-pressure alone, which may be great without imparting an undesirable heat to the apartments, or vice versa. With my device, containing an expansible liquid affected by the atmosphere of the room, it will be seen

that the regulation is made dependent upon the very conditions affecting the comfort of the persons occupying the room.

Having thus described my invention, what I claim as new is—

1. The heat-regulator herein described, consisting of a receptacle, B, filled with an expansible liquid, and having an extended and contracted neck bored to receive a piston, and terminating in a stuffing-box, in combination with a piston and lever, or its equivalent, adapted to be attached to the doors or dampers of the furnace, substantially as described.

2. The heat-regulator A, constructed as described, and filled with an expansible liquid, in combination with the wire or cord, a weight, E, distending said wire or cord about pulleys f, and a gravity acting or falling draft-door of a furnace, substantially as described.

EDWARD STANLEY GARY.

Witnesses:

BENJ. LACY,

WM. H. STEWART.