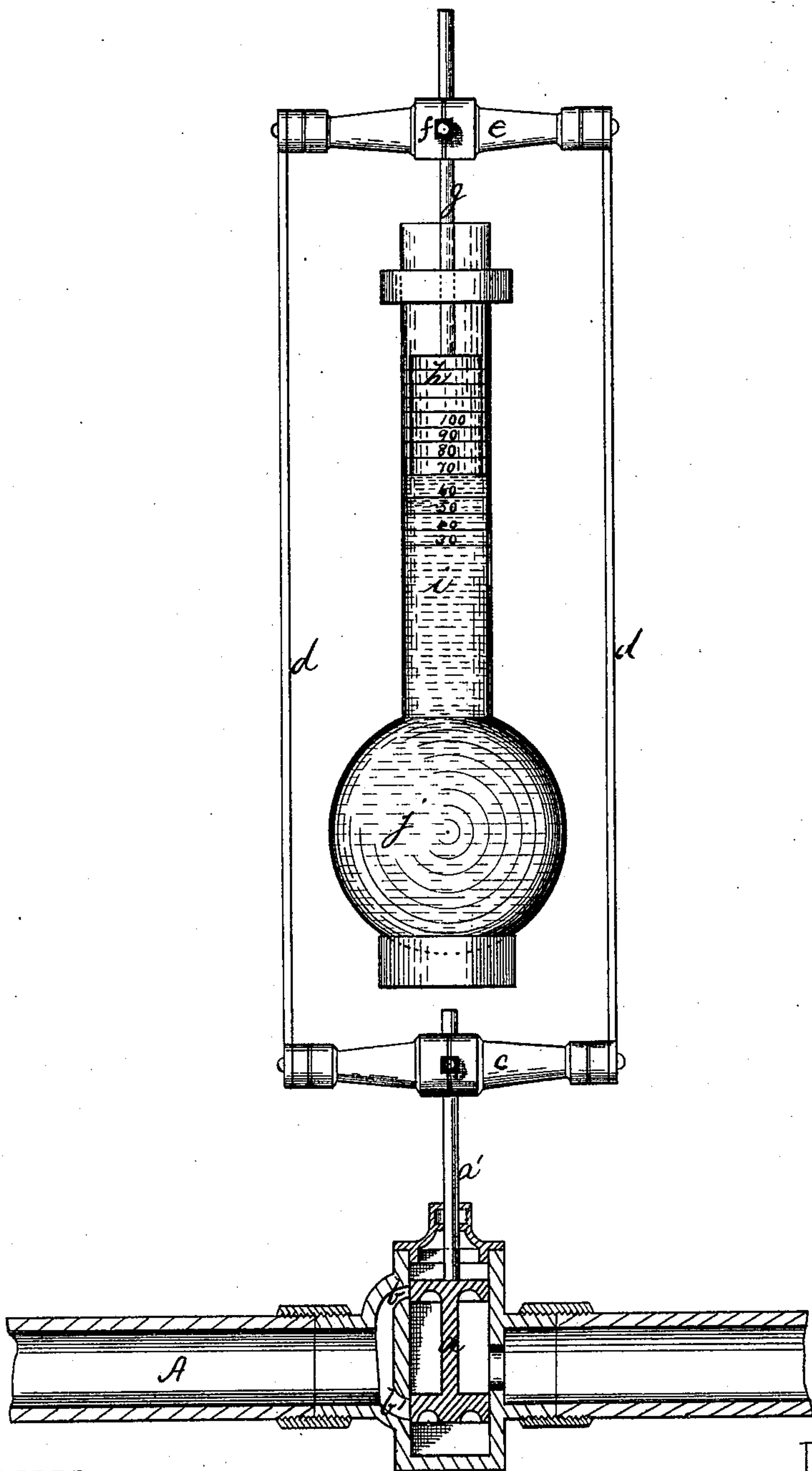


E. ARMSTRONG.
 Device for Indicating and Automatically Regulating
 the Temperature of Apartments.

No. 200,497.

Patented Feb. 19, 1878.



WITNESSES.
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UNITED STATES PATENT OFFICE.

EDWARD ARMSTRONG, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR TO
HIMSELF AND JAMES R. HUTCHINSON, OF SAME PLACE.

IMPROVEMENT IN DEVICES FOR INDICATING AND AUTOMATICALLY REGULATING THE TEMPERATURE OF APARTMENTS.

Specification forming part of Letters Patent No. **200,497**, dated February 19, 1878; application filed
February 2, 1878.

To all whom it may concern:

Be it known that I, EDWARD ARMSTRONG, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Devices for Indicating and Automatically Regulating the Temperature of Apartments; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification, in which the devices are shown partly in elevation and partly in section.

My invention relates to devices for indicating the temperature of rooms and automatically regulating the same; and consists in combining with a valve or register a graduated mercury-column or other thermometer and intermediate adjustable devices, for causing the expansion or contraction of the metal to operate the valve at any desired predetermined temperature.

I will now proceed to describe my invention, so that others skilled in the art to which it appertains may apply the same.

In the drawing, A indicates the steam-inlet pipe leading to a steam-radiator, and provided with a valve, *a*. In the present instance a balance-plug valve is shown, its seat having two ports, *b b'*; but the construction of the valve may be varied at will, valves and dampers that require little play or motion being always preferably employed with my devices.

The stem *a'* of valve *a* is secured either rigidly or adjustably, as shown, to a light cross-head, *c*, which is connected by links or rods *d* with a second cross head or bar, *e*, centrally of which, or in line with stem *a'* of valve *a*, is adjustably secured, by means of set-screw *f*, the stem *g* of a float or piston, *h*. This float *h* is of such dimensions as to fit snugly within the bore of a tube or hollow column, *i*.

i indicates a hollow column or tube for reception of mercury or other suitable material, preferably of glass, with bulb or reservoir *j*, and graduated in like manner and for the same purpose as an ordinary thermometer.

The tube *i* is secured by means of a bracket to a side wall or any other suitable fixed point in the room, and over or near the valve or register to be operated therefrom.

While the damper or valve is still closed, and the stem *g* is free to move through cross-head *c*, the float or piston *h* is raised or lowered in the bore of tube *i* until its under surface is opposite the mark upon the tube corresponding to the temperature required to be maintained in the room, when the stem is fixed in the cross-head by the set-screw *f*.

If the temperature of the room is below the desired point, the float will sink in the tube, permitting the cross-head to fall and operate valve *a*, (or a damper, if connected to such,) admitting steam to the register (or opening the hot-air induct or register) until such time as the air of the room is raised to or about the desired temperature, when the float or piston will be lifted, forcing up the cross-heads and closing the valve.

In lieu of the column of mercury or liquid thermometer, a metallic thermometer, or a long copper rod provided with adjustable connections to cross-head *c*, might be employed; but I do not deem such construction as desirable as that shown, because not as neat, compact, or as easily adjusted.

With the copper rod an index and gage-plate would also be required where the variation of temperature was to be indicated.

The advantages of my invention are, first, that the regulator can be set to operate the valve at any desired temperature, and readily and easily changed at will; and, secondly, the float-column performs the functions of a thermometer.

I am aware that heretofore the temperature of the air of an apartment has been utilized by means of confined-air chambers, mercury-columns, and electrical connections, and the expansion and contraction of metals, to control valves, ventilators, and dampers; but so far as I am aware no such devices, conjoined with direct-acting and positive mechanism, have been so constructed as to permit of the adjustment of the valve for any given tem-

perature, and which would, at the same time, both indicate and control the temperature of the room. Therefore,

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

In combination with a heater or register valve, the cross-heads, the float or piston adjustably connected to the cross-head, and the

graduated mercury-column, substantially as and for the purpose specified.

In testimony whereof I, the said EDWARD ARMSTRONG, of Allegheny, county and State aforesaid, have hereunto set my hand.

EDWD. ARMSTRONG.

Witnesses:

JAMES I. KAY,
F. W. RITTER, Jr.