(No Model.) 2 Sheets—Sheet 1.

G. L. GRAY.

THERMOSTAT.

No. 327,941. Patented Oct. 6, 1885.

Fig. 1.

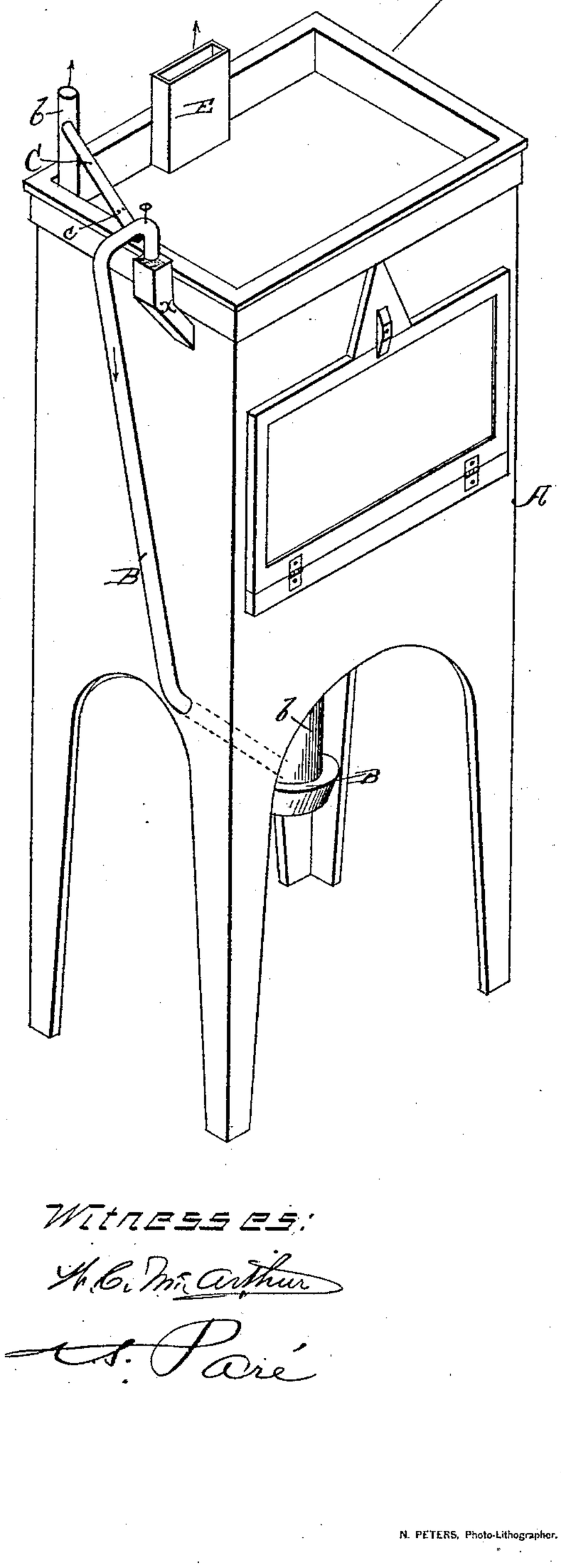
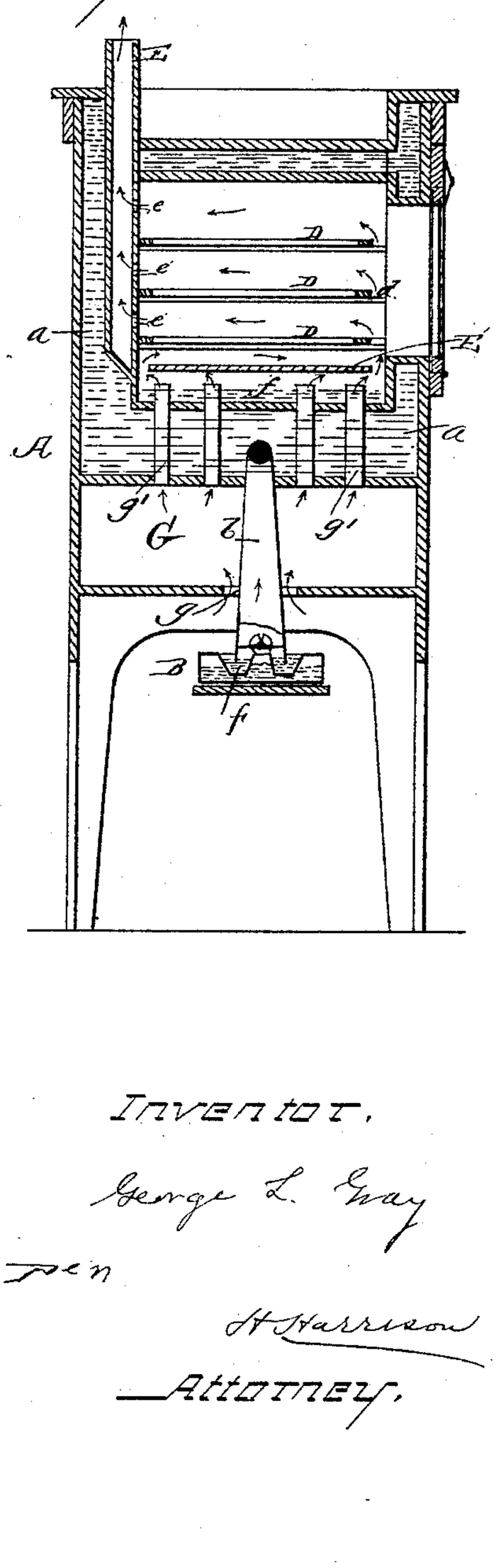


Fig. 2.



Witnesses:

H. C. McArthur

S. Paré

Inventor,

George L. Gray

per

H. Harrison

Attorney.

(No Model.)

2 Sheets—Sheet 2.

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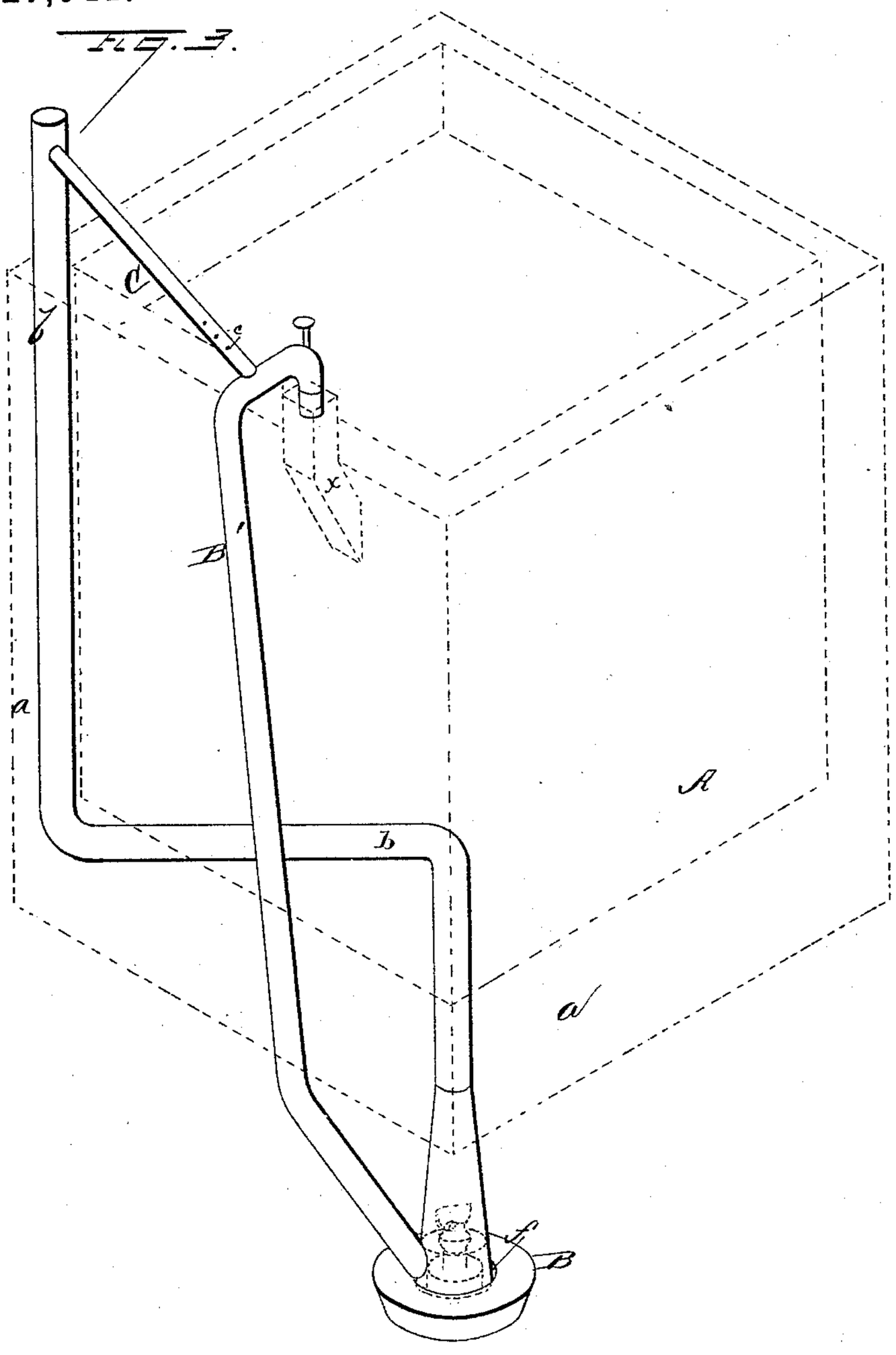
Fig. 3.



Witnesses:
H. C. McArthur
F. Stratton

Inventor.
George L. Gray
per
H. Harrison
Attorney.

UNITED STATES PATENT OFFICE.

GEORGE L. GRAY, OF CHICAGO, ILLINOIS.

THERMOSTAT.

SPECIFICATION forming part of Letters Patent No. 327,941, dated October 6, 1885.

Application filed December 4, 1884. Serial No. 149,458. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. GRAY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Incubators, of which the following is a specification, to wit:

This invention relates to an improvement in thermostats; and it consists in certain peculiarities of the construction and arrangement of the same, substantially as will be hereinafter more fully set forth and claimed.

In order to enable others skilled in the art to which my invention pertains to make and use the same, I will now proceed to describe its construction and operation, referring to the accompanying drawings, in which—

Figures 1 and 2 are respectively a perspective and a sectional view of an incubator, showing one use to which my thermostat is applicable, and Fig. 3 represents the thermostat itself arranged for this application.

A represents the main body of an incubator, which is formed with hollow walls filled with water, as at *a*, and is heated by a lamp, B, placed in any convenient position, but preferably, as herein shown, beneath the hatching-chamber. It is important in an incubator to retain an even temperature at the given point, and to automatically regulate the heating device so that this temperature shall not be exceeded or the heating device entirely extinguished, and thereby necessitate a careful watch of the device to prevent spoiling the eggs.

The lamp B is formed with a depression, *f*, surrounding the base of the burner-support, and when in use this depression is filled with water or other liquid and the burner inserted in the lower end of a smoke-escape and heating tube, *b*. This tube passes up through the hollow wall or water-chamber *a*, and serves to heat the water which surrounds the hatching-chamber. The lower end of the flue *b* rests in the sealing-depression *f* of the lamp and effectually prevents the admission of any air at that point.

To supply air in proper quantity, I connect with the flue *b* below the lamp-burner a supply-tube, B′, which extends upward and has its end inverted over an offset of the main body and the water which it contains. The air which feeds the flame must enter at this point and pass through the tube B′ to the lamp, and thence the smoke and heated air pass off through the flue *b*. It will readily be seen that when the water in the hollow body becomes heated it expands and rises in the offset and nearly closes the end of the supply-pipe. This cuts off a portion of the amount of air supplied to the flame and it burns with less force. The balance is thus soon obtained and an even temperature maintained at the desired point.

The outer end of the supply-pipe is provided with a movable section, *x*, which is adjusted nearer to or farther from the exposed surface of the water, as desired, to regulate the degree of heat obtained. Should the water become hot enough to entirely close the supply-tube, it is evident that the lamp would go entirely out, and to prevent this I connect the supply-tube B′, by a pipe, C, with a somewhat higher point on the escape-flue *b*. When the supply of fresh air is nearly or quite cut off, the heated air, instead of passing off, circulates around through the connection C and supply B′ again to the flame, and a sufficient quantity of fresh air is drawn in at the outer end of the escape-flue to keep the flame from going out or smoking. This connection C may be placed at any point desired upon the supply and escape pipes; but a downward draft of air must be maintained in the supply-pipe.

To insure a sufficient supply of fresh air to prevent the lamp from going entirely out when the end of pipe B′ is closed, I prefer to form one or more small perforations, *c*, in the pipe C, which will admit just sufficient fresh air to effect the desired object. I also prefer to connect the pipe C with the flue *b* at a higher point than with the supply B′, and thus cause the smoke and products of combustion to pass directly off without any portion being drawn back to the lamp till the end of the supply is partially closed.

I have shown this device as applied to an incubator, for which it is especially designed; but it may be used for the distillation of liquids, and for any other purpose where it is important that an even temperature should be maintained; and I do not therefore desire to be confined to the particular arrangement herein

shown, but shall vary this as circumstances shall dictate, preserving the main principles of the device, which insure its proper operation, as described.

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

1. In a thermostat, a heating device provided with a smoke-escape pipe, and an air-supply pipe, which is closed at a given temperature, in combination with a pipe connecting the escape with the supply, whereby the heated air is drawn into the flame again when the supply is wholly or partially closed, substantially as and for the purpose set forth.

2. In a thermostat, a heating device provided with a smoke-escape and an air-supply, the latter of which is closed at a given temperature, in combination with a connecting-pipe between the supply and escape, formed with a small opening, which, when the main supply is closed, supplies air enough to prevent the lamp from going out, substantially as and for the purpose set forth.

3. In a thermostat, a heating device provided with an escape-flue, and an air-supply pipe closed at a given temperature, in combination with a connecting-pipe between the two, joining the escape-flue at a higher point than its junction with the supply-pipe, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE L. GRAY.

Witnesses:
W. C. McARTHUR,
CHAS. KRESSMANN.