A. H. TINGLEY.

Heat-Regulator for Hot Air Furnaces.

No. 168,297. Patented Sept. 28, 1875.

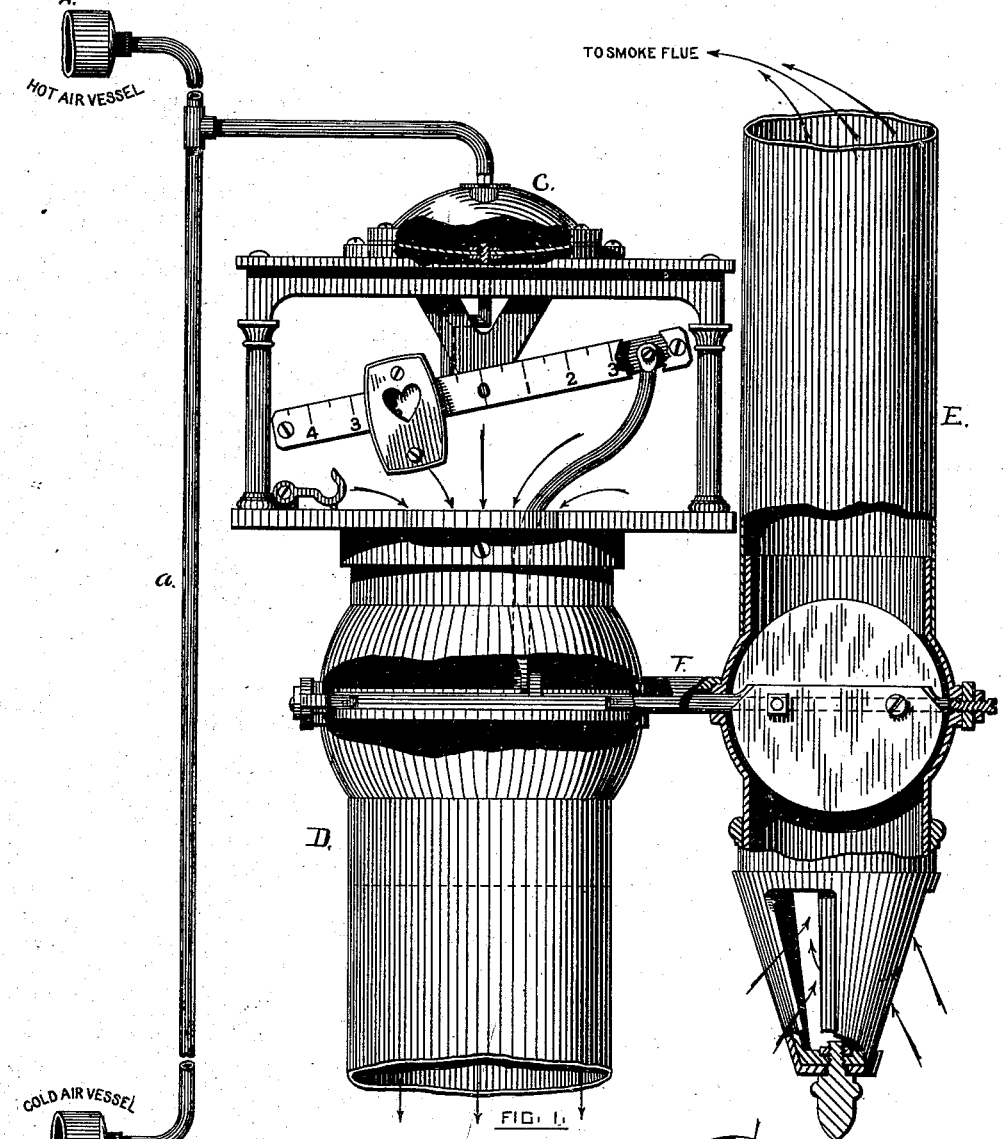

FIG. 1.

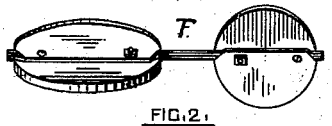

FIG. 2.

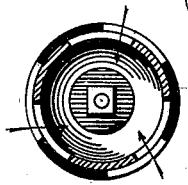

FIG. 3.

WITNESSES.

Albert D. Brian

Milton H. Shattuck

INVENTOR.

Albert H. Tingley

UNITED STATES PATENT OFFICE.

ALBERT H. TINGLEY, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN HEAT-REGULATORS FOR HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **168,297**, dated September 28, 1875; application filed May 13, 1875.

To all whom it may concern:

Be it known that I, ALBERT H. TINGLEY, of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Automatic Heat-Regulators for Hot-Air Furnaces, &c.; and I do hereby declare that the following specification, taken in connection with the drawing, making a part of the same, is a full, clear, and exact description thereof.

Figure 1 is a view of the apparatus, with improvements attached. Fig. 2 is a view of the damper. Fig. 3 is a horizontal section of damper, showing outer and inner shell.

My invention consists in certain improvements in the apparatus for regulating hot-air furnaces, &c., for which Letters Patent were granted me October 30, 1866, and February 15, 1870, hereinafter described.

The essential features of such apparatus, so far as is necessary to be stated to understand the improvements hereinafter described, are the employment of two vessels filled with air or other elastic fluid, connected by a pipe, in combination, the one with the hot-air chamber of a heating apparatus, and the other with the cold-air supply, the contents of which vessels, whether air or other like fluid, are increased or diminished in volume by fluctuations in the temperature of the surrounding air in the places wherein they are respectively situated; and such change in volume, being accompanied by movement causing pressure upon one side or the other of a sensitive diaphragm, induces changes in the position of the valve which governs the admission of draft-air to the fire-box of the furnace.

In many furnaces, especially those that have been long in use, the admission of draft-air to the fire-box cannot be completely controlled by the valve within the draft-pipe, but on the contrary a considerable quantity will find its way to the fire-box through cracks and loose joints, thus in a measure rendering the apparatus inoperative.

A, Fig. 1, represents the vessel which is located within the hot-air chamber of a furnace. B is a like vessel, so located as to be exposed to the cold air; and *a* the pipe connecting the two vessels. C is an enlargement of a branch from the pipe *a*, containing the diaphragm. D is the draft-pipe, within which is the valve which regulates the admission of draft-air to the fire-box.

It becomes necessary in order to insure the successful working of the apparatus to provide a means by which the supply of draft-air can be completely excluded when the temperature has risen to a sufficient height to close the valve within the draft-pipe D.

For this purpose I connect with the smoke-flue a pipe, E, extending downward beyond the top of, and parallel with the draft-air pipe D, and in close proximity thereto. The pipe E is open at the lower end, and near its extremity is provided with a valve attached to the elongated axis of the valve within the draft-air pipe D, but at right angles thereto.

It will now be readily seen that as one valve closes the other opens, and vice versa, so that when the valve in the draft-air pipe D is closed the valve in the pipe E will be open, thus establishing a direct draft to the flue above the fire, and effectually cutting off the introduction of draft-air to the fire-box through the cracks and joints of the furnace.

In case the flue-pipe E is not required it may be closed at the bottom in any convenient way.

What I claim as my invention, and desire to secure by Letters Patent, is—

The draft-air pipe D, flue-pipe E, and compound damper F, operating in combination with the hot and cold air vessels A B, and communicating pipes, diaphragm, and lever, substantially as and for the purpose set forth.

ALBERT H. TINGLEY.

Witnesses:

ALBERT D. BEAN,

MILTON H. SHATTUCK.