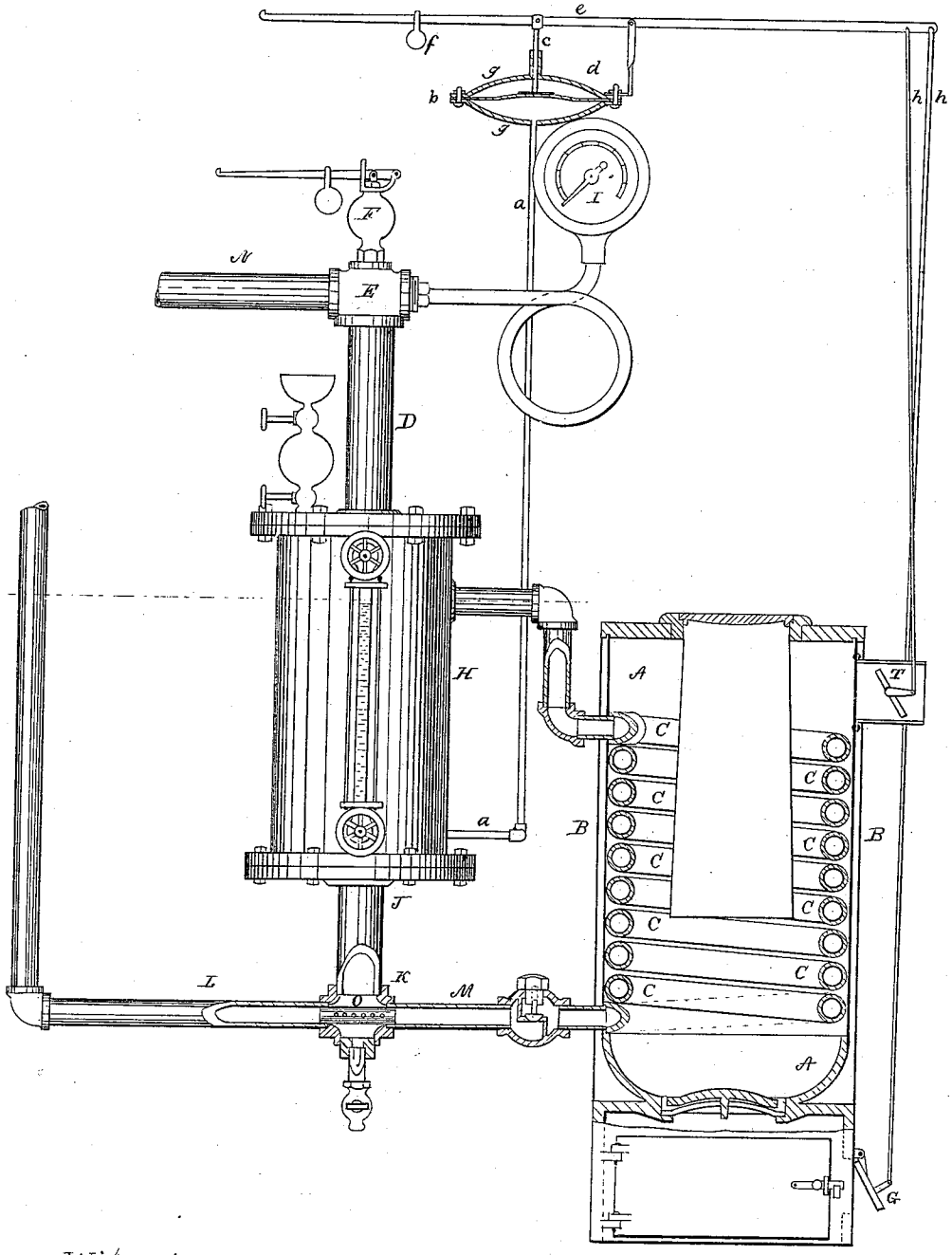
(No Model.)

S. BRADLEY.

HEATING APPARATUS FOR BUILDINGS.

No. 330,462. Patented Nov. 17, 1885.



Witnesses
J. Edward Ludington
Hiram A. Gray

Inventor
Stephen Bradley
per George Terry
Atty

UNITED STATES PATENT OFFICE

STEPHEN BRADLEY, OF NEW HAVEN, CONNECTICUT.

HEATING APPARATUS FOR BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 330,462, dated November 17, 1885.

Application filed October 22, 1884. Serial No. 146,186. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN BRADLEY, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Heating Apparatus for Buildings, of which the following is a specification, reference being had therein to the accompanying drawing.

The drawing hereto annexed is a view of my improved heating apparatus, some of the parts being in section.

My invention relates to a heating apparatus for warming buildings; and it consists in novel constructions and combinations, as the same are hereinafter more fully described and explained.

To enable others to make and use my improved apparatus, I will give a description of the same in detail.

The furnace A is cylindrical in form, and has the usual grates and ash-box. It has an opening in the top, into which a hollow cylinder is inserted, which has a flange on its upper end which rests on the top of the furnace and supports the cylinder. The jacket B surrounds the furnace and forms an air-space between it and the furnace, to prevent the escape of heat. The coil C is arranged within the furnace, and is connected at the bottom with an outside pipe for supplying water to the coil. Its upper end extends outside the furnace upward and into the reservoir H. From the top of the reservoir the pipe D extends to the cross E. From one arm of the cross a pipe, N, extends through the rooms to be warmed and returns, connecting with the pipe leading to the bottom of the coil, so that there is a continuous connection from the top of the coil to the bottom outside of the furnace by pipes and other means. The upper arm of the cross E connects with an ordinary safety-valve, F, consisting of a valve held in its seat by a lever and weight. The other arm has a pipe inserted which connects with the usual steam-gage, I. From the bottom of the reservoir H a pipe, J, extends downward and connects with the cross K. In one arm of this cross is the pipe L, and the opposite arm is connected with the pipe M. The lower arm is connected with a small cock for emptying the apparatus. Within the cross is a small horizontal pipe, O, in the side of which are several small apertures. One end of the pipe O is fitted into the pipe L and the other end into the pipe M. The pipe M extends from the cross K to a common check-valve, which consists, mainly, of a valve in its seat situated within a globe and arranged so the flow of water can only be toward the coil C. The reservoir H is cylindrical in form and has its ends closed. A glass tube is attached to the reservoir by the usual connections, in which are cocks, which show the height of the water in the reservoir. Near the outer edge of the reservoir, inserted in the top, is a well-known device for filling the same with water, which consists of a hollow globe with a valve above and below and a funnel. Near the bottom of the reservoir H is inserted a pipe, *a*, which extends upward and connects with the diaphragm *d*, which is for regulating the draft. The diaphragm consists of a rubber sheet, *b*, clamped between two circular concave metal pieces, *g*, which are held together by bolts. The rubber sheet is free in the center to move up and down, and on it rests a thin metal disk attached to a rod, *c*. The rod is attached to a lever, *e*, pivoted in a support, and near one end is a movable weight, *f*. At the other end of this lever is inserted two rods, *h h*, one of which is attached to a valve, T, in the smoke-pipe and one to the valve G in the ash-box.

Constructed and arranged as above described, the operation of the apparatus is as follows: The reservoir and coil being filled with water up to the broken line on the reservoir, and the fire being started in the furnace, the upper portion of the water in the reservoir is raised to the boiling-point, when the steam will pass through the warming-pipe and radiators in the rooms to be warmed. So much of the steam as is condensed will return to the reservoir and the lower part of the warming-pipe.

Whenever in the operation of the apparatus the water falls below the lower part of the upper portion of the pipe connecting the reservoir and coil, the steam escaping from the water in the coil will relieve the check-valve

from pressure on the side of the coil, and as a result the check-valve will open, let water into the coil, and thus the water will be maintained at equal heights in these three parts. The small holes in pipe O allow the water from reservoir H and pipe J to pass into the pipe-sections L M, and to rise, as in the warming-pipe N, to the level of the water in said reservoir, as indicated by the broken line in the drawing.

It is obvious from the above construction that so long as there is any water in the reservoir or warming-pipe it will be utilized to keep water in the coil. It is also obvious that if the connecting-pipe between the reservoir and coil entered the reservoir below the water-line the bubbles of steam passing through the water would make a noise, which would be conducted by the warming-pipe to all parts of the house. It is also obvious that as the water in the coil begins to boil the steam-bubbles formed in the coil will force some of the water out of the coil and over into the reservoir, and that were it not for the small holes in the pipe O a too rapid current would be formed through the check-valve into the coil, and that these small holes moderate the current and flow of water into the coil on starting the apparatus.

The operation of the diaphragm and pipe leading to it and other parts connected with it is obvious, and needs no explanation.

I am aware that it is not new to pass water to the water-back of a range, thence through a pipe to the upper part of a boiler, thence to a coil, where it parts with its heat to the air of a flue, thence to the bottom of the boiler, and thence again to the water-back of the range, to be heated again. This, therefore, I do not claim.

Having described my improved apparatus and its mode of operation, what I claim as new, and desire to secure by Letters Patent, is—

1. The perforated pipe O, the pipe-sections L M, connected thereby, and the reservoir H and pipe J, which supply water to said pipe O, in combination with coil C, which connects with section M, heating devices for said coil, a pipe which connects the upper end of said coil to the upper part of said reservoir, and a pipe extending from the upper part of said reservoir to pipe-section L aforesaid, substantially as set forth.

2. The reservoir H, coil C, a heating device for said coil, the supply-pipe for said coil, and a heating-pipe which extends from the upper end of said reservoir to the said supply-pipe, in combination with a pipe whereby the water passes from said reservoir to said supply-pipe, a check-valve located in said supply-pipe between the coil and the water-supply, and a pipe extending from the upper end of said coil to the upper part of said reservoir, substantially as set forth.

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

STEPHEN BRADLEY.

Witnesses:

GEORGE TERRY,

J. EDWARD LUDINGTON.