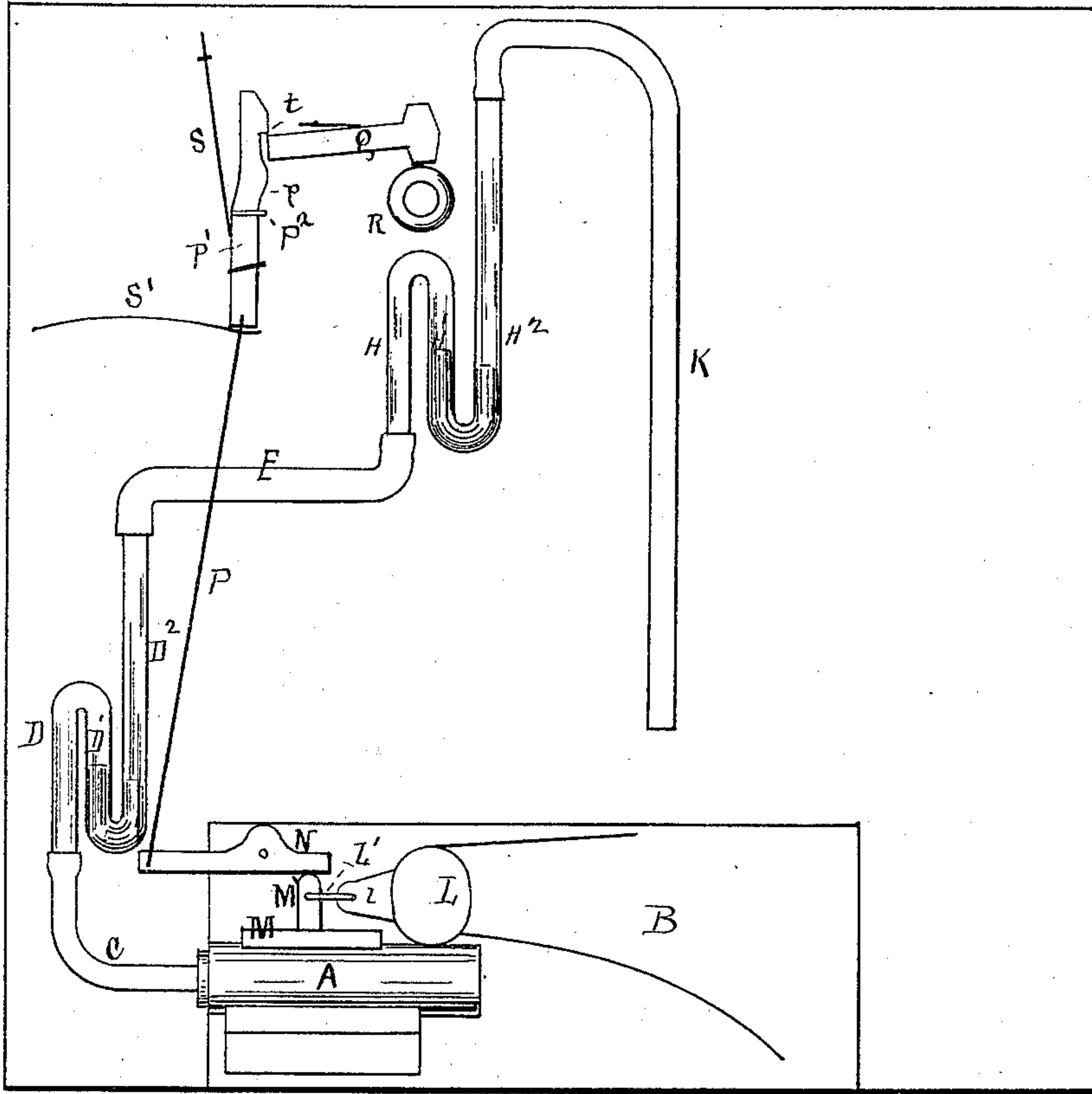


T. S. SMITH.

Water Indicators for Steam-Boilers.

No. 157,727.

Patented Dec. 15, 1874.



Witnesses

Frankl. Parker
E. A. Nickerson

Inventor

Throphilus S. Smith

Mr William Edson City

UNITED STATES PATENT OFFICE.

THEOPHILUS S. SMITH, OF SOMERVILLE, MASSACHUSETTS.

IMPROVEMENT IN WATER-INDICATORS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. 157,727, dated December 15, 1874; application filed May 12, 1874.

To all whom it may concern:

Be it known that I, THEOPHILUS S. SMITH, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Water-Indicators for Steam-Boilers, &c., of which the following is a specification:

My invention consists in connecting a series of glass indicators, made in the form of siphons, or in any desired style, and containing some fluid, the position of which serves as the indicator, with a compressible reservoir, which is acted upon by a float connected with the water in the boiler. The action of the float being communicated to the reservoir causes it to be compressed more or less, the amount of compression being in proportion to the height of water in the boiler, and is indicated by the height of the fluid in the glass indicators, so that the height of water in the boiler may be ascertained by inspection of any one of the glass indicators. These indicators may be placed in any part of the building, or at any reasonable distance from the boiler.

The drawing is an elevation of my device, and shows two indicators, which may be supposed to be in different stories of the building in which the boiler is located.

Any desired number of the indicators, $D D^1 D^2 H H^1 H^2$, may be connected in one series, to indicate at different points the height of the water in the boiler.

L is a float-chamber, connected with the boiler B by a water and steam pipe, in the usual manner, so that the water in the float will be level with the water in the boiler. Within the float-chamber L I hang a float, the stem of the float being pivoted at l , and extending in the form of a lever, as shown at L' , so that L' will move with the float. $M M'$ is a compression-pad, connected with the lever L' , and resting on the reservoir A ; hence any movement of the float within the float-chamber L will be communicated, through the lever L' and pad $M M'$, to the compression-reservoir A , and increase or diminish the pressure of its contents. $D D^1 D^2$ is a siphon-indicator, to be partially filled with any suitable fluid. I prefer sulphuric acid. One end of this indicator is connected with the com-

pression-reservoir A by the pipe C , and its other end directly or indirectly to a compensating-reservoir, K , the air in each reservoir being kept under some pressure when the water is above the low-water line, and at an even temperature.

Any number of indicators, like $D D^1 D^2 H H^1 H^2$, may be arranged in the same series, and connected to each other and the reservoir A and K , as shown.

These indicators may be located in different apartments, and are to be partially filled and each provided with a scale, which is to be marked to correspond with the height of the water in the boiler. Thus, if the water in the boiler is at the second gage-cock, then the height of the liquid in the indicator should stand at a mark on the scale to indicate the second gage-cock. Now, if the water in the boiler rises or falls, the float will act on the compression-reservoir A , and through the air in it on the fluids in the indicators, and thus show the height of the water in the boiler.

Q is an alarm-hammer, that is arranged by means of the sliding latch P^1 , cord P , and lever N , so that when the water gets very low in the boiler an alarm is sounded.

The action of this alarm is as follows: The piece M' rises and falls with the action of the float—that is, if the float gets very low, M' will rise up, and thus depress the outer end of the lever N . This, acting through the cord P , will draw down the sliding latch P^1 , so that the incline at p , contacting with the stop P^2 , causes the latch to move back so far as to free the notch t from the handle Q of the alarm-hammer, and thus cause it to strike, the springs $S S'$ causing the latch P^1 to come back into place.

The compensating-reservoir K consists of a descending pipe located near the ascending line of pipes. The object of so forming and locating the compensating-reservoir is that the air contained in it shall be of the same temperature as the contained air of the ascending pipes.

That the air of the reservoir and ascending pipes will be of the same temperature is obvious, from the fact that both are in the same medium, and, being together, must be exposed to the same influence of heat.

I claim as my invention—

1. The combination of one or more indicators, $D D^1 D^2$, with a compression-reservoir, A, and a float, all operating together substantially as described, and for the purpose set forth.

2. The combination of the compensating-

reservoir K, arranged as described, with the indicator $D D^1 D^2$, all operating together for the purpose set forth.

THEOPHILUS S. SMITH.

Witnesses:

WILLIAM EDSON,

FRANK G. PARKER.