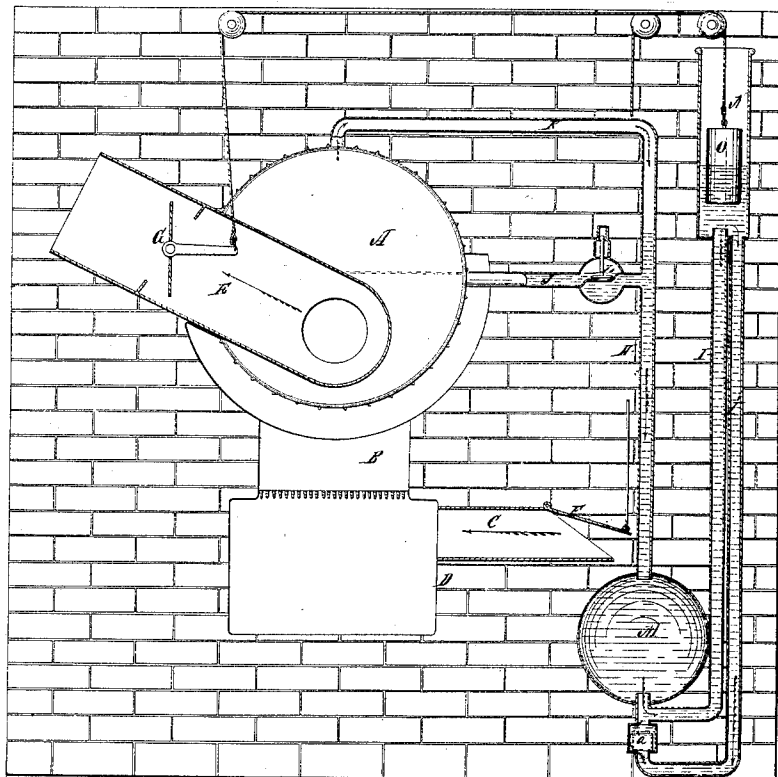


C. A. Wilson,
Boiler-Furnace Draft-Regulator.

N^o 28,123.

Patented May 1, 1860.



Witnesses:

James H. Gaitley

Inventor:

C. A. Wilson
By [Signature]

UNITED STATES PATENT OFFICE.

CHARLES A. WILSON, OF CINCINNATI, OHIO.

STEAM-BOILER REGULATOR.

Specification of Letters Patent No. 28,123, dated May 1, 1860.

To all whom it may concern:

Be it known that I, CHAS. A. WILSON, of Cincinnati, Hamilton county, Ohio, have invented new and useful Improvements in Steam-Boiler Regulators; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings making part of this specification.

My invention is designed to extend the range of action and the efficiency of those boiler attachments in which a hydrostatic column acting through an inverted siphon is made to regulate the generation and pressure of steam.

In the accompanying drawing an apparatus embodying my invention is illustrated by a vertical section.

A represents a boiler, B furnace, C draft inlet, D ash pit, E escape flue, F and G dampers regulating respectively the draft inlet and the escape flue.

H and I are two limbs of an inverted siphon. Of these the limb H terminates above in two branches, the lower one J communicating with the boiler a little below the desired water level, and the upper branch K, communicating with the steam space.

The branch J contains a check valve L to prevent any retrograde motion of the water from the boiler—its weight nevertheless being so slight that it will open whenever the water rises in the pipe H higher than in the boiler itself. The limb H near its lower end expands into a chamber M. The limb I at its upper end is of larger diameter so as to form a cup N which will receive without overflowing whatever water is forced into it by the steam.

O is a float which rests upon the water in the cup N and communicates, as shown, with the dampers F and G. The narrow portion of the limb I rises somewhat above the floor of the cup N to secure in the bottom of said cup a supply of water beyond the reach of escaping steam. A supplementary limb I' descends from the bottom of the cup N and communicates below with the extreme lower end of the limb H. A check valve *a* at the point of junction prevents any flow from the limb H into the limb I' but allows a free passage in the opposite direction.

Operation: The apparatus being charged with water a little above the branch J, and steam being raised—and the float connec-

tions being adjusted to hold the dampers open to the desired extent, the formation of steam acts to depress the water in limb H resulting in a corresponding elevation in limb I, so that for every inch of such depression two inches of hydrostatic pressure is obtained. In this way should the steam continue to expand, the limb H and chamber M may become emptied of water and steam ascending through the limb I will blow off, and thus by relieving the pressure act as a safety vent. The steam having in its descent reached the chamber M a given depression of water in said chamber will cause a very considerable elevation of the hydrostatic column in the limb I so that by the time the steam has displaced the water wholly from the chamber M, the cup N is nearly full, and the float O being at its uppermost position closes the dampers F and G and arrests the combustion. In order however to prevent the column of water being forced upward out of the limb I, I provide a supplementary limb I' which the moment that its check valve is relieved of water above it, opens and lets in water, and thus by maintaining a circulation, prevents the depletion of the limb I. On the subsidence of the steam the water thus displaced, together with that resulting from condensation, returns to the limb H and any excess above the water level of the boiler flows back through the branch, into the boiler.

In the application of the invention to steam generators of house heating apparatus, several striking advantages are apparent. These generators usually occupy cellars of very limited height and as it is inadmissible to extend any of the piping into the principal floor an equivalent hydrostatic column in an apparatus of ordinary construction would involve the necessity of sinking the entire boiler into the ground to a depth equal to the bend of my siphon, while my apparatus requires only a cavity of sufficient horizontal dimensions to receive the siphon.

My plan allows several pounds pressure to be easily secured yet provides a means of perfect safety consisting of an open tube without valves and entirely free from any obstruction to the escape of excessive steam other than the hydrostatic column itself, yet returning always to its effective condition.

Mercury taking the place of water in the

siphon, the device is applicable to high pressure boilers, and by allowing the siphon to pass into the hold a combined safety and regulating attachment is provided which would make explosion impossible.

I claim as new and of my invention herein and desire to secure by Letters Patent—

1. The inverted siphon H I, branches J, K, and check valve L, in the described combination with a steam boiler for the purposes set forth.

2. The described combination of the inverted siphon H I with the cup N, float O

and dampers F, G, for the purposes set forth.

3. The supplementary pipe I' provided with a check valve *a* and connecting the float cup N with the bottom of the siphon H I for the purposes set forth.

In testimony of which invention, I hereunto set my hand.

C. A. WILSON.

Witnesses:

GEO. H. KNIGHT,
C. STEEMER, Jr.