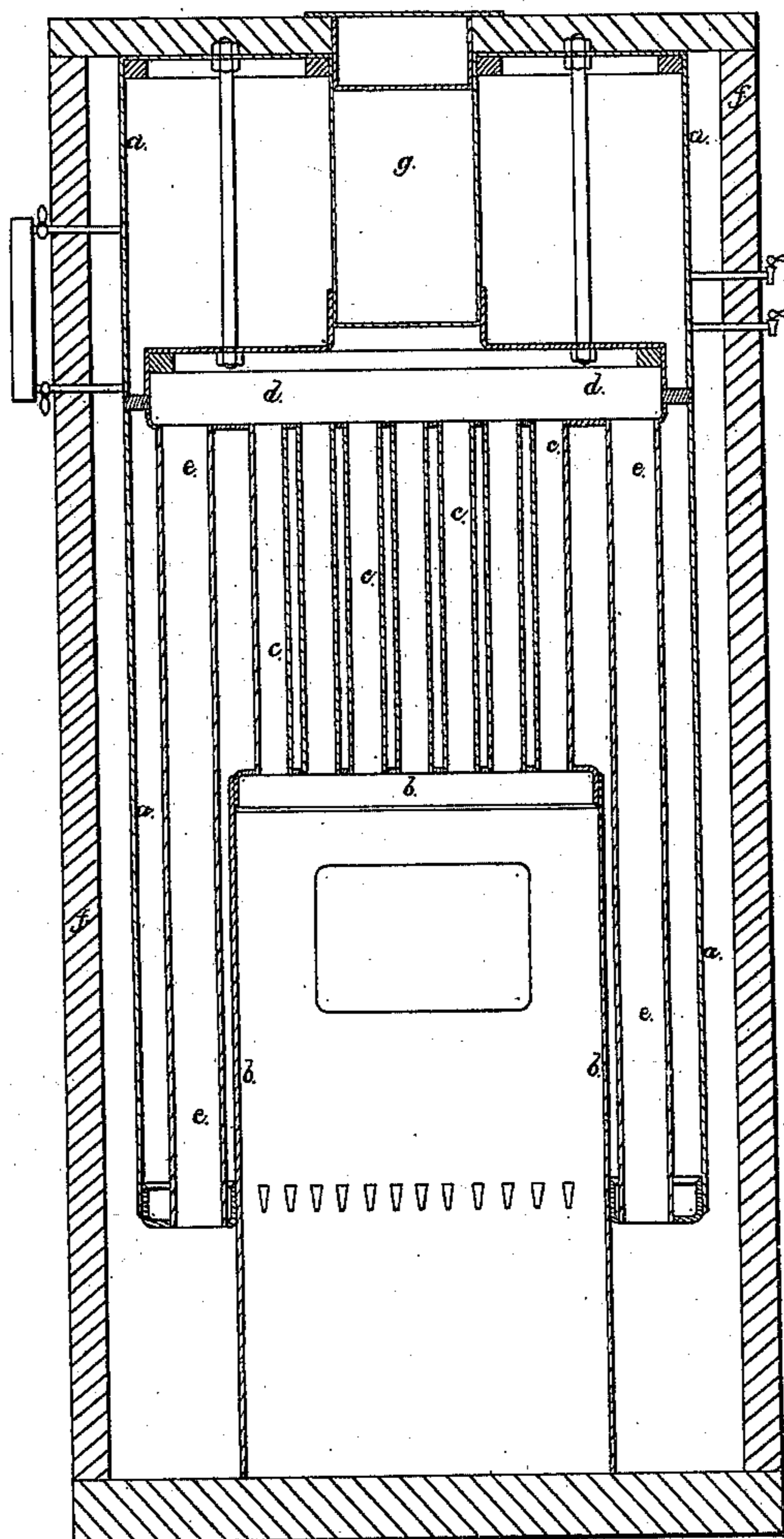
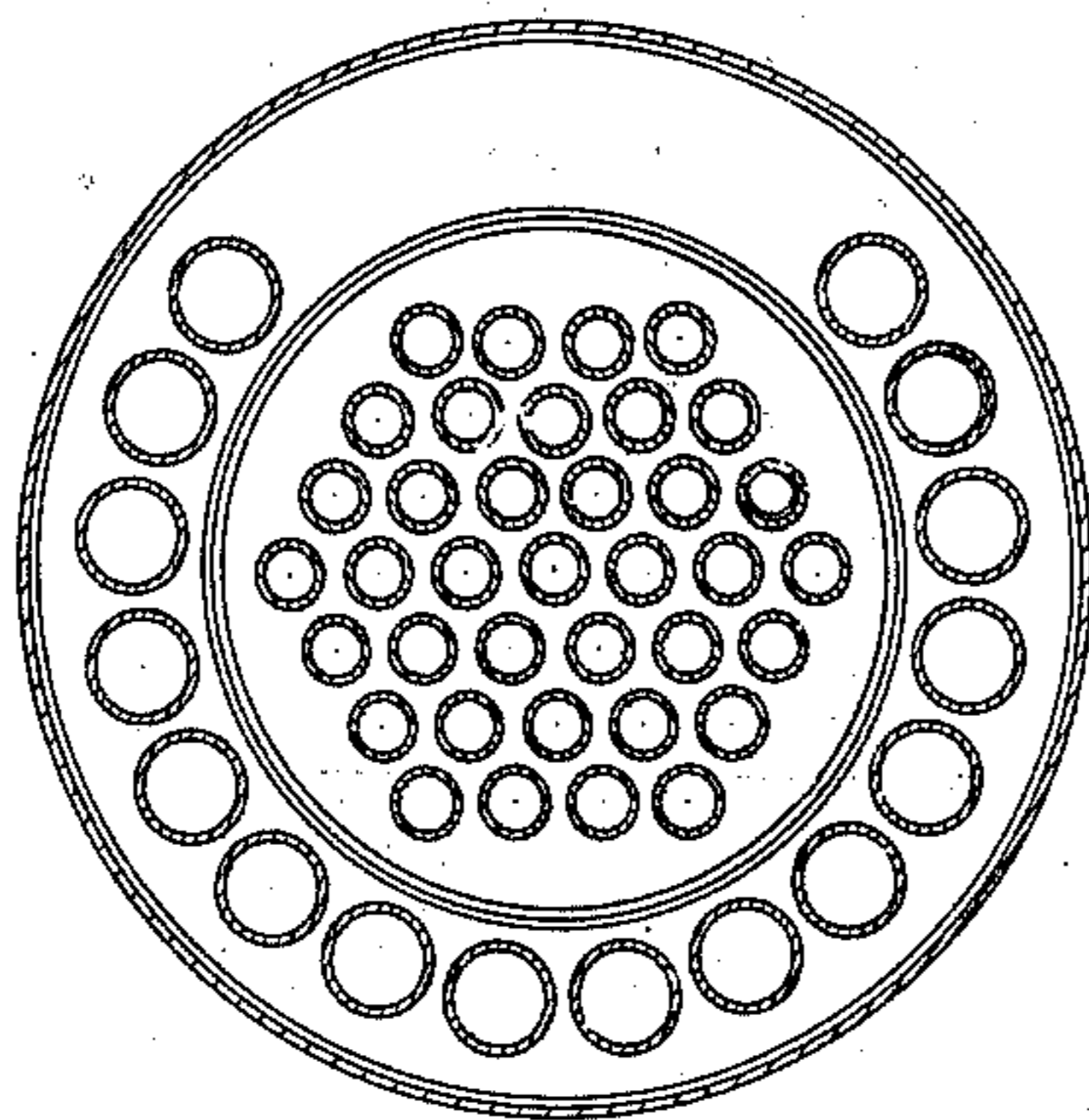


J. Q. A. Sargent.

Water Tube.

N^o 8,543.

Patented Aug 25, 1868.



Witnesses,

*W. Warren Brown.
L. H. Latimer.*

Inventor,

*J. Q. A. Sargent.
By his Attor,
Crosby & Steel & Sons.*

United States Patent Office.

J. Q. A. SARGENT, OF MANCHESTER, NEW HAMPSHIRE.

Letters Patent No. 81,543, dated August 25, 1868.

IMPROVEMENT IN STEAM-GENERATORS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, J. Q. A. SARGENT, of Manchester, in the county of Hillsborough, and State of New Hampshire, have invented an Improved Steam-Generating Boiler; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practise it.

This invention relates to matters of detail in the construction of vertical steam-boilers having submerged smoke-boxes, the precise subject of the invention being stated beyond, in the claim.

The drawing shows, in vertical central sectional elevation, a boiler embodying my invention—

a denoting the outer shell, *b* the combustion-chamber, connected by direct vertical tubes *c* with the smoke-box *d*, from which return-tubes *e* descend through the space between the shell *a* and the fire-box *b*, so as to discharge the volatile products of combustion, at the base of the boiler, into the space surrounding it, and between the boiler-setting *f*, from which space the smoke and gases can pass off to a chimney, through a flue, opening out of said space at any convenient point.

At the top of the smoke-box is a chamber, *g*, closed at its top, and into which the hot volatile products of combustion can enter, to superheat the steam contained in the top of the boiler, above the water-level, and around said chamber *g*.

The smoke-box *d* is wholly submerged, so that its surface does not contribute to superheating the steam in the dome of the boiler, the water-level being indicated in the drawing at its highest and lowest planes, and there being combined with the boiler gauge-cocks, as seen at the right of the drawing, or a glass water-gauge, as seen at the left of the drawing, to indicate the height of the water-level.

In the described construction, it will be seen that the passage, from the boiler, of the volatile products of combustion is of sufficient length to reduce the heat of said products nearly to the heat of the generated steam, before allowing the smoke and gases to pass off to the chimney; also, that the outside of the boiler is protected from the atmosphere by a hot, gaseous jacket, which not only prevents condensation and cooling against the shell of the boiler, but transforms the outer surface of the boiler into effective heating-surface.

It will also be seen that, as the smoke-box *d* is always submerged, the danger of explosion, consequent upon allowing its large surface to become uncovered and heated, and then flowing it with water, thus suddenly generating more steam than the safety-valve can discharge, is avoided; still, by the use of the chamber *g*, opening out of the smoke-box, but giving no thoroughfare through it to the gases, there is presented by said chamber a sufficient surface of moderately-heated metal to evaporate all the free water mechanically held in suspension by the steam above the water-level, and to slightly superheat the steam.

If desired, the cover or stop for the chamber *g* may be arranged as a valve, capable of being opened to the chimney, when starting a fire, so as to give a direct passage to the smoke until combustion is fairly established in the fire-chamber, when the cover or valve will be made to stop the temporary outlet from the chamber *g*, and the operation of the boiler will then be as described.

I claim a boiler, constructed and arranged substantially as herein set forth.

J. Q. A. SARGENT.

Witnesses:

GEORGE H. TRUE,
C. W. STANLEY,