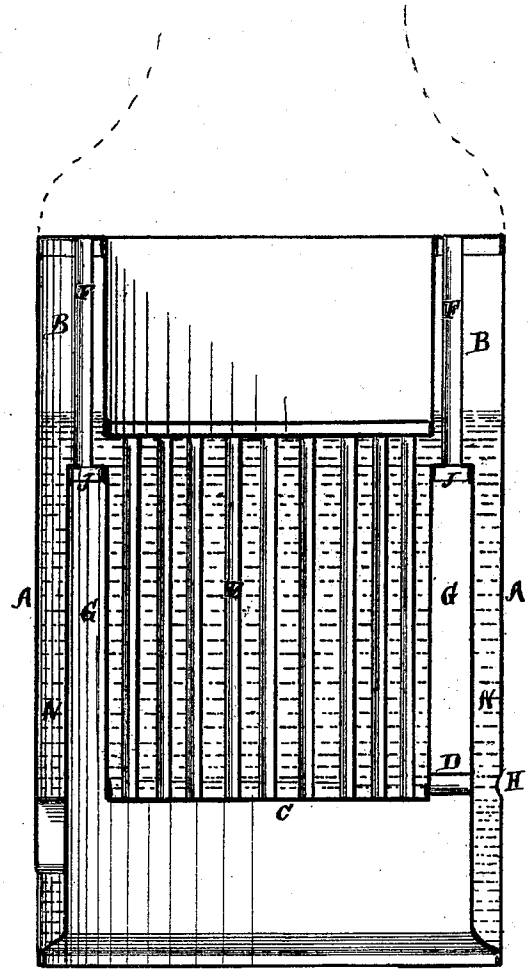
C. M. MILLER.

Vertical Steam-Boilers.

No. 141,656. Patented August 12, 1873.



Witnesses.

J. A. Loughborough

J. Milton Howe

Inventor.

C. M. Miller

By Wm. S. Loughborough

Atty.

UNITED STATES PATENT OFFICE.

CASSIUS M. MILLER, OF PHELPS, NEW YORK.

IMPROVEMENT IN VERTICAL STEAM-BOILERS.

Specification forming part of Letters Patent No. **141,656**, dated August 12, 1873; application filed March 31, 1873.

To all whom it may concern:

Be it known that I, CASSIUS M. MILLER, of Phelps, in the county of Ontario and State of New York, have invented certain Improvements in Vertical Steam-Boilers, of which the following is a specification:

This invention relates to that class of steam-boilers which are designed more especially for steam fire-engines and agricultural engines; and it consists essentially in the following features, viz: First, in the employment in vertical or upright tubular boilers of an annular steam-dome; second, in dropping the central portion of the boiler down so that its lower end shall be suspended somewhat into the fire-box, and its upper end being correspondingly dropped, and sufficiently to insure the covering at all times of the upper end of the combustion-tubes contained in such central portion with water; and third, in connecting the lower end of such suspended portion to the annular water-space surrounding the fire-box by means of two or more lateral flues or tubes, for the purpose of securing a more perfect circulation.

The drawing is a vertical central section of an upright tubular steam-boiler containing my invention.

A represents the outer case or shell of my boiler; B, the annular steam-dome; C, the centrally suspended portion of the boiler; D, the circulation-tubes; E, the central combustion-tubes; and F, similar tubes passing up through the annular steam-dome.

By depressing or dropping the central portion of my boiler down, as shown, I secure the following primary advantages: I am able to keep the upper end of the tubes E constantly covered by water, or below the low-water line, thereby preventing them from burning out, and from rusting off; I secure an unbroken fire-surface of both walls of the annular space G, besides, by means of the combustion-tubes F, an annular deflection of the caloric current, which is believed to utilize a large percentage of heat, resulting from the combustion of a given amount of fuel over the plan of allowing said caloric current to ascend in a central column.

I prefer several lateral or circulation tubes, D, and opposite each would provide a hand-hole, as shown at H, through the outer wall of the boiler, for the purpose of cleaning such tubes, and affording access to the inner portion C of the boiler.

The dotted lines at the top of the figure indicate the base of the smoke-stack.

The proposed plan of flanging of the several portions of the boiler are clearly indicated in the drawing.

The tubes F I prefer to thread at the lower end and screw into the plate J, and flange the upper end. The tubes E may be flanged at both ends.

The peculiarities in the construction of this boiler are believed to afford or combine the essential advantages of cheapness, durability, and rapidity in the generation of steam, the latter advantage resulting from the great amount of fire or heating surface afforded in a boiler having the other requisites or qualities mentioned.

What I claim as my invention is—

1. In combination with the central water-space C and annular combustion-chamber G, and water-space N, the water-circulation tubes D, for the purposes set forth.

2. The combustion-tubes F, in combination with the annular steam-dome B and annular water-space N, substantially as and for the purposes set forth.

3. The arrangement of the annular steam-dome B and combustion-flues F with relation to the annular water-space N and central water-chamber C, with its combustion-flues E, substantially in the manner and for the purposes set forth.

CASSIUS M. MILLER.

Witnesses:
WM. S. LOUGHBOROUGH,
WILLIAM R. HOOD.