E. D. LEAVITT, Jr.

Steam-Boiler.

No. 165,006. Patented June 29, 1875.

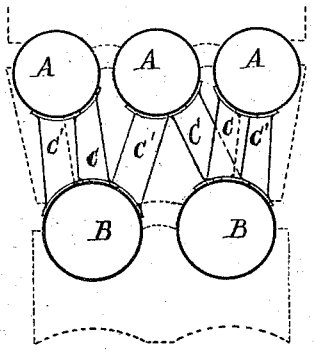

FIG. 1.

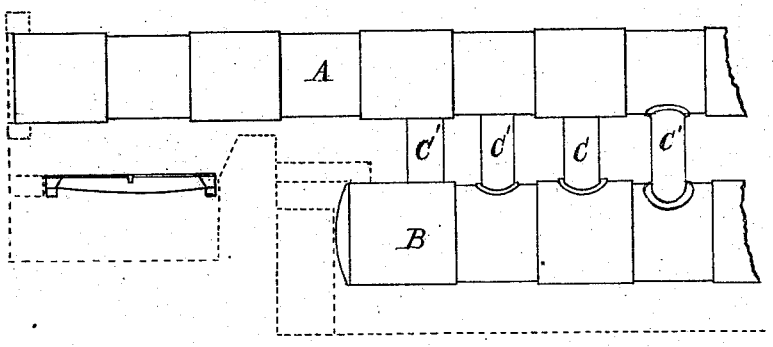

FIG. 2.

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Wm. C. Hibbard Atty

INVENTOR.

WITNESSES.

N. D. Lombard

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UNITED STATES PATENT OFFICE.

ERASMUS D. LEAVITT, JR., OF CAMBRIDGE, MASSACHUSETTS.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **165,006**, dated June 29, 1875; application filed January 13, 1875.

To all whom it may concern:

Be it known that I, ERASMUS D. LEAVITT, Jr., of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Steam-Boilers, of which the following is a specification:

My improvements relate to that variety of cylinder-boilers which are set in two tiers, one above the other, and are connected together by upright passages, and are inclosed in a brick or other furnace, the lower boilers being filled with water, and the upper ones partly filled with water and partly with steam; and the purpose of the invention is to so arrange the passages as to insure a more perfect circulation of the water in the boilers, and prevent the lodgment of the steam or of the sediment in places that might endanger the boilers by overheating them.

The first part of my invention consists in the arrangement of a series of water-legs, connecting the upper boiler or boilers with the lower boiler or boilers in two or more rows on each boiler, so that a part of them are connected with the upper boiler or boilers at the lowest point, and extend downward, and are attached toward the side of the lower boiler below the top; and the other water-legs are attached to the lower boiler or boilers at the highest point, and extend upward and are attached toward the side of the upper boiler or boilers above the lowest point, as will be described. By this means a free circulation of the water will be established, and the steam formed in a lower boiler will be prevented from lodging at the top, but rise with the current of water directly into the upper boiler, and the sediment of the upper boiler will not be deposited upon the bottom of it over the fire, but will be carried down with the descending current of water and deposited on the bottom of the lower boiler below the fire, and thus avoid all danger of blistering the iron by reason of the deposit.

The second part of my invention consists in the arrangement of the water-legs so that each of the lower boilers will be connected with two or more of the upper ones, by which the circulation of the water and pressure of steam will be more equally distributed, as will be more fully described and shown.

In the drawings, Figure 1 is a transverse sectional elevation of a set of fire-boilers, with the interior of the brick-work of the furnace shown by the dotted lines. Fig. 2 is a side elevation of the front portion of the same, the dotted lines also showing the interior of the brick-work of the furnace.

Five boilers are represented in the drawings as forming the set, with three of them forming the upper tier, and two of them the lower tier.

A A A are the upper boilers, and B B the lower ones. They are simply plain cylinder-boilers, of the desired length, and are connected with each other throughout their length by several lines of water-legs, as will be described. C C′, &c., are the cylindrical water-legs or passages which connect the lower boilers with the upper ones. The legs C are connected with the lower boilers at the top directly over the center, and to the lower side of one of the upper boilers at one side of the center, and extend some distance up its side; and the legs C′ are attached to the bottom of the upper boilers directly below the center, and to the lower boilers at one side of the center, according to its position, as shown in Fig. 1 of the drawings.

By this arrangement of the legs the currents of water will flow upward through the legs C and downward through the legs C′, and by means of the duplicate connections of each lower boiler with two upper ones a free and active circulation will be maintained throughout them all.

The front ends of the lower boilers are made considerably shorter than the upper ones, and leave a sufficient space for the fire-place, bridge-wall, and flue, as is seen in Fig. 2; and the lower boilers are so closed in by the brick-work as to leave their upper parts exposed to the direct action of the fire.

The boilers are made long, like the ordinary cylinder-boilers, and they are connected by the water-legs throughout their length to insure a free circulation in all parts.

What I claim is—

1. The combination and arrangement of a set of two or more boilers in two tiers, each lower boiler being connected with an upper one by two rows of water-legs, one of them

attached to the top of the lower boiler and toward the side of the upper one, and the other row attached to the bottom of the upper boiler and toward the side of the lower one, substantially as described.

2. The combination with the lower boiler of two duplicate rows of water-legs, each duplicate series operating as described, and each being connected with a separate boiler of the upper tier, substantially as described.

Executed 7th January, 1875.

E. D. LEAVITT, JR.

Witnesses:
JAMES W. POTTER,
WM. C. HIBBARD.