

F. COLLIGNON.
STEAM-BOILER.

No. 172,557.

Patented Jan. 25, 1876.

Figure 1.

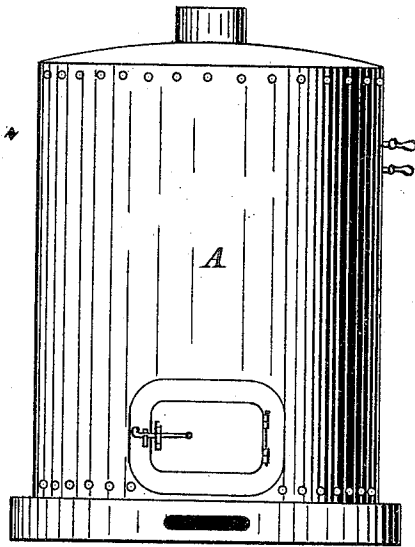
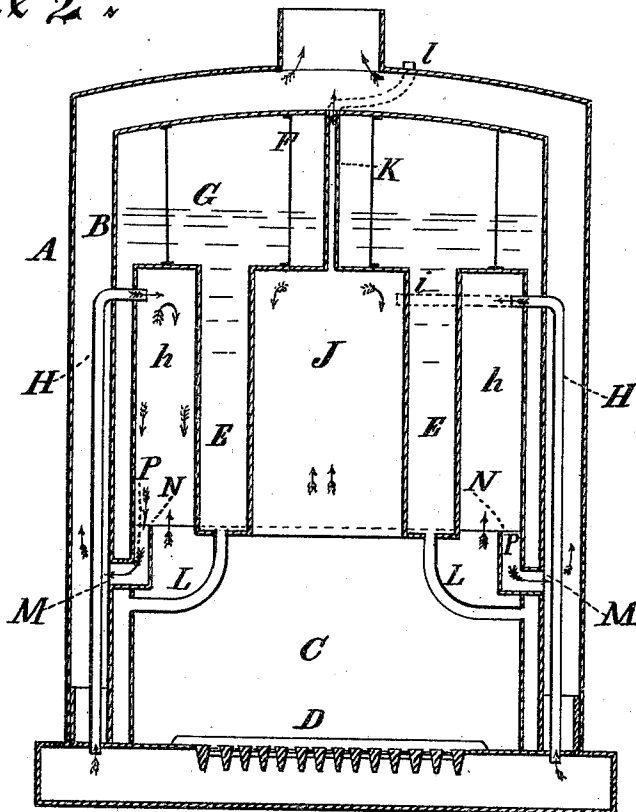


Figure 2.



Witnesses,

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Inventor,

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UNITED STATES PATENT OFFICE.

FRANK COLLIGNON, OF BUFFALO, NEW YORK.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **172,557**, dated January 25, 1876; application filed September 30, 1875.

To all whom it may concern:

Be it known that I, FRANK COLLIGNON, of the city of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Steam-Boilers, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

This invention consists of one or more annular water-space vessels, connected within the boiler above the fire-grate and above the openings leading to the smoke-stack, so as to form the upper part of the furnace, in combination with one or more tubes for admitting air to intermingle with and perfect the combustion of the ascending gases, as will be more clearly hereinafter described.

In the said drawings, Figure 1 is a side elevation of the boiler complete; and Fig. 2 represents an enlarged view, showing a vertical longitudinal section through the center of the same.

A is the outer casing or jacket; B, the outer shell of the boiler; C, the furnace; D, the fire-grate; E E, the annular water-space; F, the steam-room, and G the water-line. H H represent air-tubes for conducting or admitting air to the upper parts of the fire-space *h h*, surrounding the annular water-space. If desired, the air-tubes H H may be connected to a perforated ring made in the form of a tube, and arranged within the upper part of the annular fire-space *h h*; or said tubes may be extended through the annular water-space into the air-space J, as shown by the dotted lines *i*, and perforated within the space *h h*, so as to admit air to both fire-spaces; but I prefer the arrangement shown. K is a tube for admitting air to the central fire-space J. Perhaps it would be well to extend it through the jacket outside, as shown by the dotted lines *l*.

L L represent water-circulating tubes, which connect the lower part of the annular water-vessel with the boiler. M M are openings for carrying off the smoke. They are surrounded by a ring or guard, N, which partly covers them, leaving an opening at P leading thereto. The rim or guard N prevents a large portion of the smoke and heat from passing out of the openings M M until they have passed up to the top of the air-spaces *h h* and K.

The operation of the boiler is as follows: Fire being started at C, the hottest parts of the products of combustion pass up into the spaces *h h* and J, and meet a current or a regulated quantity of fresh air at or near the top from tubes H H and K, thereby producing an intense heat.

The direction of the current of the products of combustion is shown by the arrows, the heat rising and then being drawn down again through the openings M M into the jacket, and from thence to the smoke-stack. It is obvious that only the colder portions of the heated gases are drawn down and out into the smoke-stack, the hotter portions being always at the top of the annular space *h h* and J, and in the best location for imparting heat to the water, which naturally ascends up through it, it being almost impossible to boil water from the top downward.

I claim as my invention—

The annular water-vessel E E, suspended above the fire-grate, in combination with the tubes H H K and the openings M M, arranged below the annular water-space compartment, substantially as and for the purposes described.

FRANK COLLIGNON.

Witnesses:

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