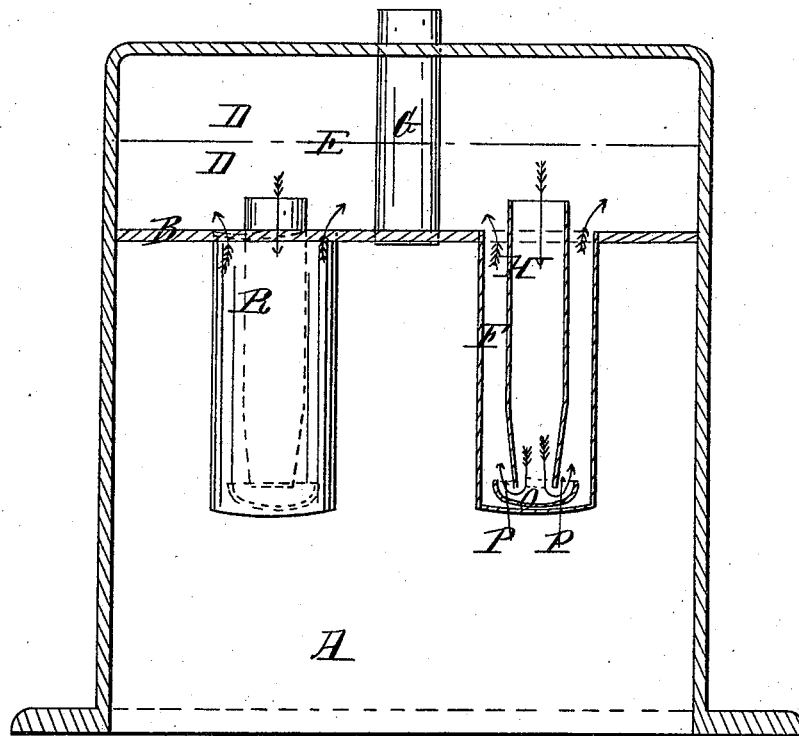


B. Fitts,
Steam-Boiler Water-Tube.
N^o 54,318. Patented May 1, 1866.



Witnesses,
L. H. Gould
D. B. Hadden

Inventor,
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UNITED STATES PATENT OFFICE.

BENAI AH FITTS, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN BOILER-TUBES.

Specification forming part of Letters Patent No. 54,318, dated May 1, 1866.

To all whom it may concern:

Be it known that I, BENAI AH FITTS, of the city of Newark, county of Essex, and State of New Jersey, have invented a new and useful Improvement in Circulating-Tubes for Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making a part of this specification, in which the figure is a vertical section of a boiler, showing tubes in position as arranged.

The construction is as follows: A is the fire-box; B, the crown-sheet, or that part directly over the fire; C, the smoke-pipe; D D, space for the water and steam; E the water-line.

F is a vertical section of a boiler tube, made tight in the crown-sheet and closed tight at the lower end.

H is a vertical section of a circulating-tube, with peculiarly-formed openings at the lower end, placed inside of the tube F, reaching from near the bottom to a little above the crown-sheet, for the purpose of keeping the tube F well supplied with water, as the rapid generation of steam in the tube F drives the water out.

O is a cap placed under the tube H, to prevent the steam formed under and around the end of the tube from passing into it.

P P are openings to allow the water to pass out of the tube H, as shown by the arrows.

The tube H and cap O may be connected together, but in such a manner as to leave the openings P P sufficiently large for the egress of the water, they then being placed in position within tube F. The tube H may lean against the side, the cap O resting upon the bottom, or otherwise held in position, care being taken that the parts of contact between tubes F and H and cap O should be small, to

prevent the transmission of heat from tube F to the water within tube H; also, that the openings P P should be near the lower end of tube F, so as to supply water to that part which is most exposed to heat.

R is a boiler-tube, in which is a circulating-tube in proper position.

The operation is as follows: When the heat is applied to the outside of the tube F, steam being formed inside, no steam is generated inside of the circulating-tube H. The steam in the space outside of tube H and inside of tube F rises to the surface, carrying a portion of the water along with it, thus forming an upward current, the cap O preventing any steam from entering the tube H, thus allowing the water to pass down the circulating-tube and out at the openings P P in the direction shown by the arrows, thereby keeping a constant supply of water in that part of the boiler most exposed to the heat, and at the same time drawing the water from that part the least exposed.

I am aware that circulating-tubes in steam-boilers are not new. What constitutes the peculiar feature of my invention is arranging cups over such tubes, so as to keep a constant supply of water at the parts most exposed to the heat.

What I claim as new, and desire to secure by Letters Patent, is—

The cap O over the end of the tube H, leaving openings P P, or other means substantially the same, for the purpose of allowing free egress of the water from within the tube, and at the same time prevent the steam formed under and around the end of the tube from passing into it, as set forth and described.

BENAI AH FITTS.

Witnesses:

DAVID B. HEDDEN,
J. H. GOULD.