

J. M. HICKS.

Tubular Steam-Generators.

No. 134,803.

Patented Jan. 14, 1873.

Fig. 2.

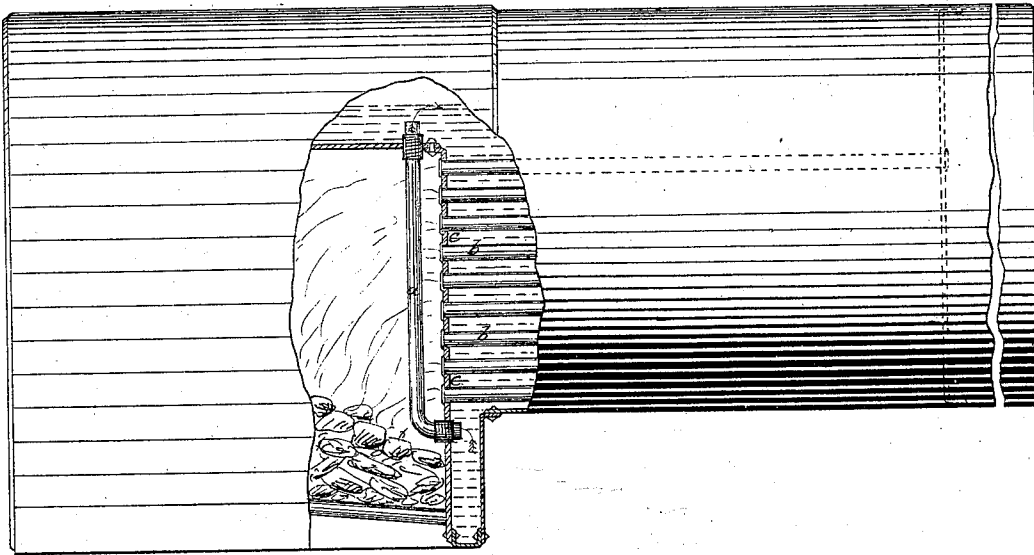


Fig. 1.

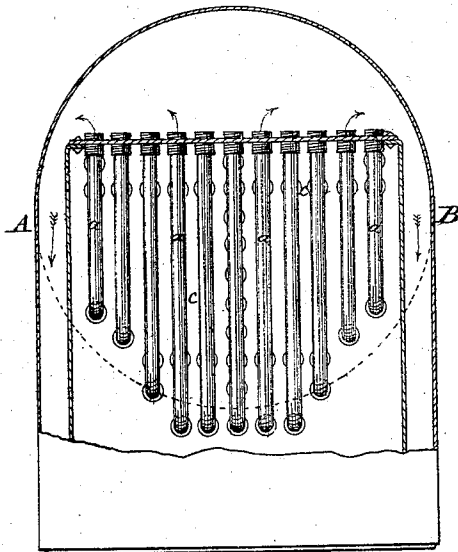
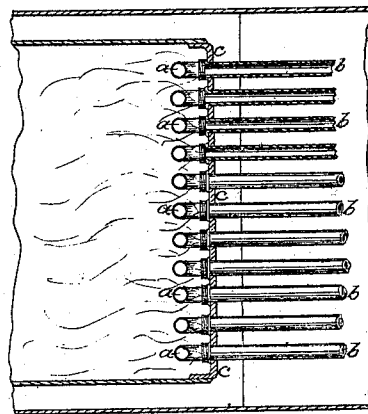


Fig. 3.



Witnesses:

Frederick Cleveland

Edwin F. Carey, Junr.

Inventor:

J. M. Hicks

UNITED STATES PATENT OFFICE.

JAMES M. HICKS, OF SUMMIT, NEW JERSEY.

IMPROVEMENT IN TUBULAR STEAM-GENERATORS.

Specification forming part of Letters Patent No. 134,803, dated January 14, 1873.

To all whom it may concern:

Be it known that I, JAMES M. HICKS, of Summit, in the county of Union and State of New Jersey, have invented an improvement in my "device for deflecting the currents of heated gases in tubular steam-generators from their direct course toward and against the tube-sheet," for which Letters Patent were granted to me by the United States of America, March 28, 1871, and numbered 113,052, of which improvement the following is a full and exact description, reference being had to the accompanying drawing which forms part of this specification.

In this drawing, Figure 1 represents a front view of my improvement, showing a fire-box and surrounding boiler-shell partly in section, and a tube-sheet, *c c*, provided with tubes *b b* and pipes or hollow pieces *a a* placed directly before the open mouths of said tubes or rows of tubes and nearly parallel to said tube-sheet, or thereabout, in such manner that the heated gases in seeking an outlet through said tubes to the chimney may be turned aside toward and in contact with said tube-sheet *c c*, and ends of tubes *b b*, before passing into them, and said pipes so attached to and through the boiler-sheets that the water from said boiler may have free access to the inner portion of said pipes *a a*. Fig. 2 represents a side view and part section of the same. Fig. 3 represents a horizontal section of the same on the line A B of Fig. 1, in part.

My improvement consists in so constructing and arranging my deflecting device before the open mouths or draft-tubes in a tube-sheet of a steam-generator or heater that they may deflect or turn the heated gases toward and against the spaces of the tube-sheet between the tube ends, and at the same time freely allow the water from the inside of the generator to enter within the inner walls of said deflecting device or pipes to prevent their being overheated by the action upon them of the fire. To this end, I construct said deflecting devices of pipes or hollow pieces, and, as shown in drawing herewith, cause them to enter the generator at convenient points, and in such a way as to allow these said hollow pieces to be situated directly in front of the mouths of said draft-tubes, at a sufficient distance from the tube-sheet as not to obstruct the draft. This arrangement I have found to work well and to allow a circulation through said pipes or hol-

low pieces, which successfully preserves them from destruction and materially adds to the efficiency of the boiler.

The operation is as follows: In ordinary tubular and flue boilers not provided with my improvements, the escaping gases pass into the tubes at points of least resistance from their surfaces, which points are nearly equidistant from the said surfaces, and furthest from them, within the lines of the same, and of course furthest from the water which is against them on their opposite sides. This action is not the one most favorable to the economical generation of steam. The heat should be brought in direct contact with the surfaces which communicate it to the surrounding water. To accomplish this result, I devised an arrangement of deflectors placed before the mouths of draft-tubes, which is represented in patent granted to me, No. 113,052, and previously referred to in this specification. In some extreme heats these deflectors are sooner or later destroyed.

To remedy this difficulty, I have applied this improvement, and its action is essentially the same as described in my former patent, as referred to above, but being hollow and directly communicating with the water of the boiler, the circulation of the same preserves them from destruction, and a valuable addition is made to the efficiency of the boiler.

There are of course various ways of attaching my improvement without departing from its principle of action. The hollow deflectors may be connected at one end with a feeding mechanism for supplying the boiler. They may all be connected together and attached at only one point to the boiler or generator.

The one method which I prefer is the one above described in this specification, without confining myself to its precise arrangement.

What I claim, therefore, as my invention, and desire to secure by Letters Patent, is—

The combination of the tube-sheet of a steam-generator and the tubular deflectors described, placed in front of the fire flues or tubes, for the purpose of deflecting the gases against the tube-sheet and circulating the water of the boiler, substantially as before set forth.

JAS. M. HICKS.

Witnesses:

TREADWELL CLEVELAND,
EDWIN F. COREY, Jr.