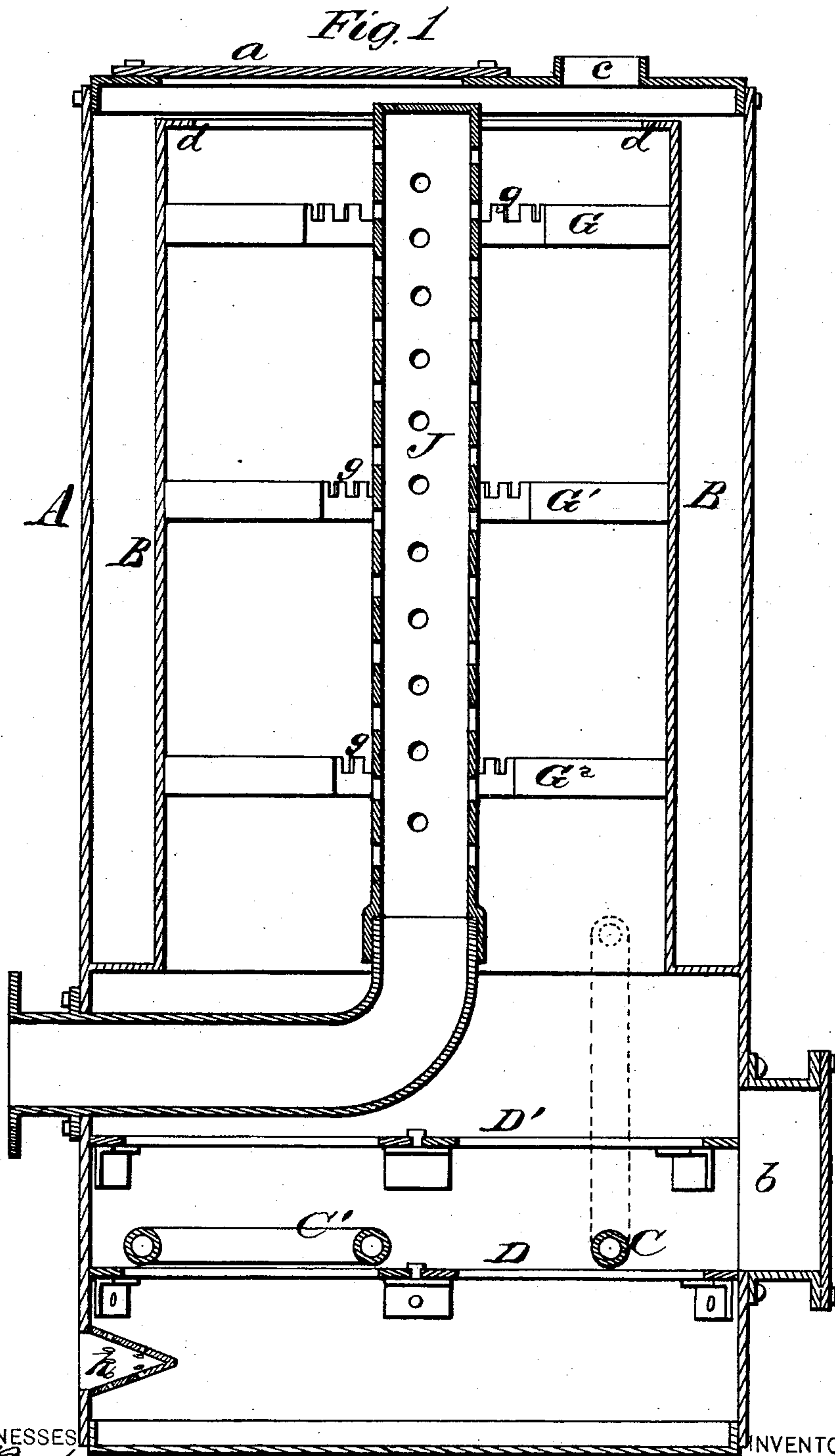


G. H. ZSCHECH.

Heaters and Sediment-Extractors for Steam-Boilers.

No 157,361.

Patented Dec. 1, 1874.



WITNESSES

*E. H. Bates*  
*Robert Everett*

INVENTOR

*Gustav Zschech*  
*Chipman Hooper & Co*  
ATTORNEYS

# UNITED STATES PATENT OFFICE.

GUSTAVUS H. ZSCHECH, OF INDIANAPOLIS, INDIANA.

## IMPROVEMENT IN HEATERS AND SEDIMENT-EXTRACTORS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **157,361**, dated December 1, 1874; application filed October 17, 1874.

*To all whom it may concern:*

Be it known that I, GUSTAVUS H. ZSCHECH, of Indianapolis, in the county of Marion and State of Indiana, have invented a new and valuable Improvement in Heaters and Sediment-Extractors 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 drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a vertical section of my heater and lime-extractor. Figs. 2 and 3 are horizontal sectional views of the same, and Fig. 4 is a detail view.

This invention has relation to means for heating feed-water for steam-boilers, and at the same time extracting the lime and other salts from the water. My object is to utilize the exhaust steam of an engine for heating the feed-water, and to conduct this steam into the center of a cylinder by means of a vertical, thickly-perforated pipe, the feed-water passing from an annular chamber inside of the said cylinder, and falling in showers from salt-arresting pans surrounding the said perforated pipe, as will be hereinafter more fully explained. Another object is to conduct the feed-water through a pipe-coil located near the bottom of the apparatus before passing this water into the annular chamber surrounding the said perforated pipe, whereby I utilize the heat of the water which is in the bottom of the apparatus, as will be hereinafter explained.

In the annexed drawings, A designates the cylindrical case of the heater, having man-holes *a b* for obtaining access to its interior, which holes will be tightly closed when the apparatus is in operation. There is also another opening, *c*, through the top of the case. Inside of this case A is an annular water-receptacle, B, which extends nearly to the top of the case, and has an overflow-flange, *d*. (Shown in Fig. 1.) C is an inlet-pipe leading from a cold-water tank, and entering the case A near the bottom thereof. Inside of the case the pipe is curved or coiled, and supported upon a grate, D. The pipe C passes outside of the case A, and communicates with the annular water-jacket B, which is thus supplied. The pipe-coil, which I shall

letter C', is arranged between the grates D D', which grates are used for supporting hay or straw and gravel, or other suitable substances on which to deposit the salts and other foreign matters in the water. G G<sup>1</sup> G<sup>2</sup> designate annular shelves, which are applied inside of the case A, and arranged one over the other. These shelves are flanged, and the circular flanges *g* are notched, so that the water flowing from the pans will be divided in a fine shower. J designates a pipe, which communicates with the exhaust-port of a steam-engine. This pipe rises vertically in the center of the case A nearly to the top thereof, and is thickly perforated, so that the steam issues from it in numerous fine jets over and between the shelves G G<sup>1</sup> G<sup>2</sup>, as indicated by the arrows in Fig. 1.

It will be seen from the above description that the feed-water flows from a cold-water tank through pipe C and its coil C', which latter is submerged in hot water, thence into the receptacle B. When this receptacle is filled the water flows over its flange *d* into the highest pan G, thence into the next pan G<sup>1</sup>, and thence into the lowest pan G<sup>2</sup>, from which latter the water falls upon and through the material which separates from it the earthy matters. The water is drawn from the bottom of the case A through a hole, *h*, which is provided with a strainer.

During the fall of the water in showers the exhaust steam operates on it to heat it and cause it to deposit its salts upon the pans, which latter can be removed through the man-hole *a* and cleaned at pleasure.

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

1. The feed-water coil C, in combination with the annular water-receptacle B, the coils arranged between grates D D', substantially as described.

2. Pans G G<sup>1</sup> G<sup>2</sup>, having notched overflow-flanges *g*, combined with the feed-water receptacle B and perforated pipe J, substantially as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

GUSTAVUS H. ZSCHECH.

Witnesses:

THOS. A. BISBEE,  
CHARLES COULON.