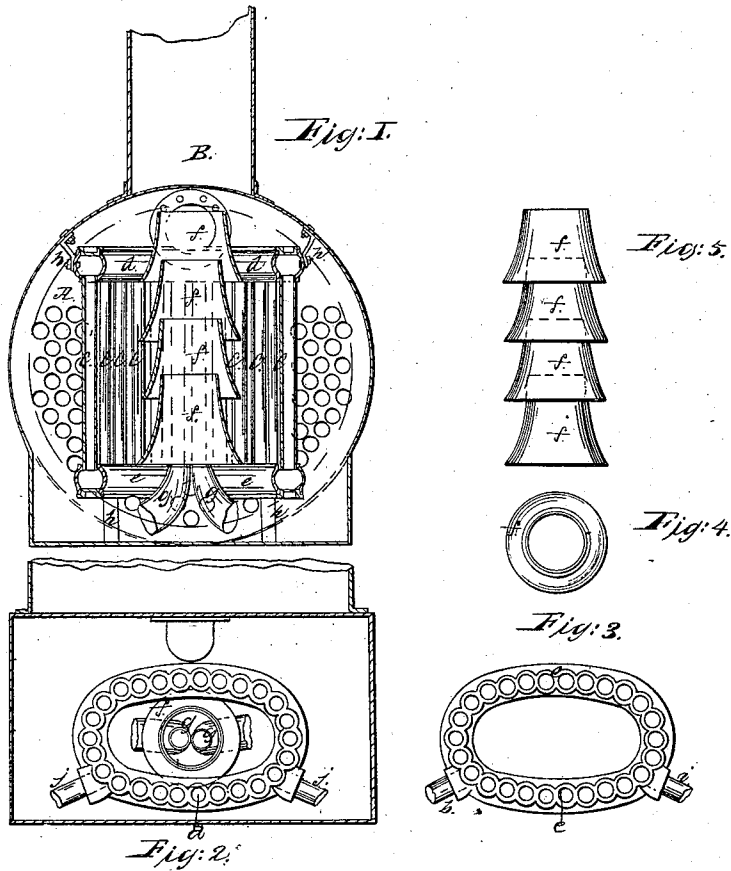


D. MATTHEW.  
Steam Boiler Water Heater.

No. 13,270.

Patented July 17, 1855.



Witnesses:

J. C. Cook  
J. C. Cook

Inventor:

David Matthew

# UNITED STATES PATENT OFFICE.

DAVID MATTHEW, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN APPARATUS FOR HEATING FEED-WATER TO LOCOMOTIVE-ENGINES.

Specification forming part of Letters Patent No. 13,270, dated July 17, 1853.

*To all whom it may concern:*

Be it known that I, DAVID MATTHEW, of the city of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Feed-Water Heaters for Locomotive-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part hereof, and to the letters of reference marked thereon.

The nature of my invention consists in an arrangement of a tubular feed-water heater with sectional cones and short exhaust-pipes in relation to each other and to the smoke-box, so that the heated gases in their course from the flues to the openings between the sectional cones causes the heat to act directly against and around them, the exhaust-pipes discharging into the low sectional cone, and forces the current up through sectional cones, causing the current to rush between each sectional cone.

The advantages of using short exhaust-pipes and a draft-chimney or cleaning-pipe in the smoke-box were set out in my patent dated February 20, A. D. 1849, and reissued October 4, A. D. 1853; and the object of this invention of a water-heater is to preserve all the advantage of this draft-chimney and short exhaust-pipes, make the water-heater present a great heating surface to the direct contact of the heat from the flues in its course to the chimney, equalize the heat upon the length of the tubing, and allow the heated water to have a free circulation between the upper and lower chambers or receiving and discharging parts of the heater.

In the accompanying drawings, Figure 1 is a vertical section through the center of the water-heater and sectional draft pipe or chimney in the smoke-box with the exhaust-pipes in place. Fig. 2 is a top view with the upper part of the smoke-box removed. Fig. 3 is a bottom view of the water-heater with the exhaust-pipes and draft-pipe removed. Fig. 4 is a top view of the sectional draft-pipe.

Like letters in the different figures refer to like parts.

A is the smoke-box, exhibiting the front flue-sheet.

B is the portion of the chimney above the smoke-box.

*c c c*, &c., are the vertical tubes, connected to the top and bottom tubes *d d* and *e e* in the same manner of connecting flues to the flue-sheets of the boiler. Opposite each of these vertical tubes is an opening fitted with a hollow screw-plug to enable the tube to be taken out or put in when necessary. These top and bottom tubes are best constructed of an oval form, as exhibited by the drawings; but this form may be changed at the option of the builder to suit the engine.

*f f*, &c., are the sections of the draft or cleaning chimney to cause the heat to enter between all parts of the tubes from top to bottom and under and above the horizontal tubes in its passage to the chimney.

*g g* are the short exhaust-pipes.

*h h h h* are stays to support and steady the water-heater.

*i i*, Fig. 3, are the feed-pipes that connect the pumps.

*j j*, Fig. 2, are the water-pipes that lead from the heater into the boiler. The water is contained inside of the tubes.

One or more series or rows of vertical tubes may be placed between the chimney and the flue-sheet of the boiler instead of the circular or oval series, as described, without changing the principle of my invention.

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

The arrangement of the tubular heater, sectional cones, and short exhaust-pipes in relation to each other and to the smoke-box, as herein set forth.

DAVID MATTHEW.

Witnesses:

JOEL COOK,  
G. B. COOK.