B FORD.

Feed-Water Heater for Steam-Boilers.

No. 210,846. Patented Dec. 17, 1878.

Fig. 1.

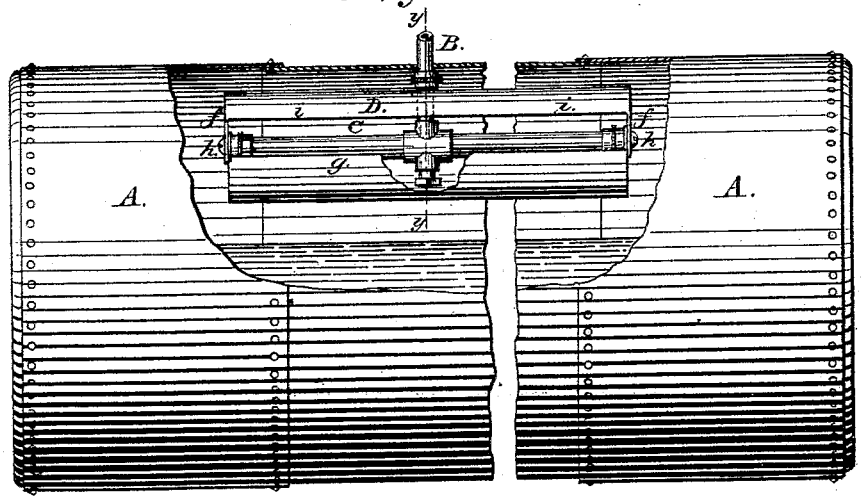


Fig. 2.

Fig. 3.

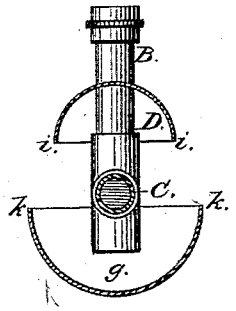
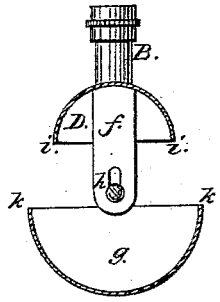


Fig. 4.



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UNITED STATES PATENT OFFICE.

BENJAMIN FORD, OF UNION TOWNSHIP, ALLEGHENY COUNTY, PA.

IMPROVEMENT IN FEED-WATER HEATERS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **210,846**, dated December 17, 1878; application filed October 28, 1878.

To all whom it may concern:

Be it known that I, BENJAMIN FORD, of Union township, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Feed-Water Heaters for Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention relates to improvements in the class of devices applied to steam-boilers whereby the feed-water will be raised to the desired temperature before it commingles with the water below in the boiler.

My invention consists in the combination of a longitudinal swinging trough or chamber, longitudinal pipe, provided with longitudinal slots, and longitudinal crown-piece, constructed, arranged, and operating with relation to each other and a feed-pipe and boiler.

It further consists in the combination, with a feed-pipe, crown-piece, and trough or chamber, of slotted pendants and set-screws, all as will be hereinafter fully described.

To enable others skilled in the art with which my invention is most nearly connected to make and use it, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification, Figure 1 is a side elevation of a steam-boiler furnished with my improvement in feed-water heaters. Fig. 2 is a top view of the slotted pipe which is attached to the water-supply pipe. Fig. 3 is a transverse section of the heater at line *y* of Fig. 1. Fig. 4 is an end view of the heater.

In the accompanying drawings, A represents an ordinary steam-boiler, and B the water-supply pipe, to the inner end of which is attached, at right angle, a longitudinal slotted pipe, C.

Over the slots *e* of the pipe C is placed a longitudinal crown, D, from each end of which is a slotted pendant, *f*, to the lower ends of which is attached the longitudinal receiving trough or chamber *g* by means of set-screws *h*.

By means of the slots in the pendants *f* and the set-screws *h*, the chamber or trough *g* can be adjusted vertically or swung on its pivots or screws, so as to have the water flow over its top edges evenly.

By the use of the slotted pipe C the water is discharged through the slots *e* against the crown D in a thin sheet, and, spreading over it, drops from its edges *i* in thin sheets into the chamber *g*, from which it flows over the edges *k* of the trough or chamber *g* in thin sheets, and passes down through the steam, and commingles with the water in the boiler.

By constructing the water-heater as hereinbefore described, cold water will never be brought in contact with the inner surface of the boiler, and the distributing-pipe C will never become clogged, and when undue pressure of water is forced into it it will cause the slots to open up, and the discharge is thrown against the crown and spread, as hereinbefore stated.

Having thus described my improvement, what I claim as of my invention is—

1. The combination of the swinging trough or chamber *g*, longitudinal pipe C, provided with longitudinal slots *e*, and longitudinal crown-piece D, constructed, arranged, and operating, with relation to each other and the feed-pipe B and boiler, substantially as hereinbefore described, and for the purpose specified.

2. The combination, with the feed-pipe B, crown-piece D, and trough or chamber *g*, of the slotted pendants *f* and set-screws *h*, substantially as and for the purpose herein shown and described.

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