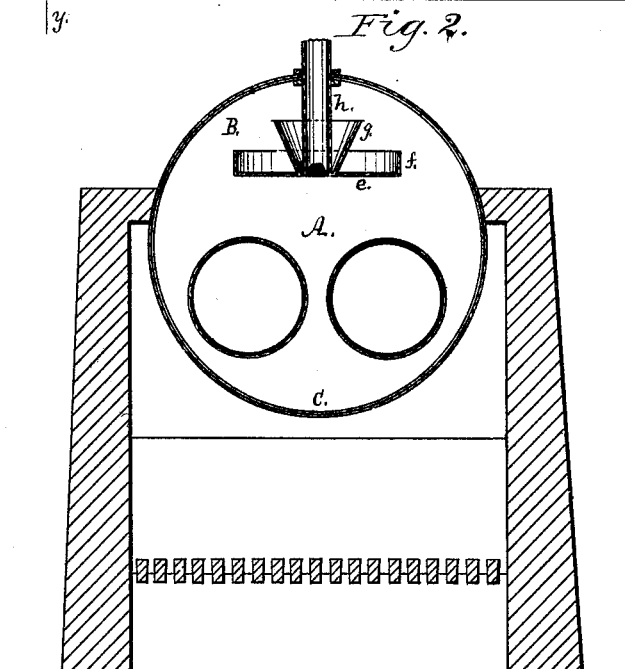
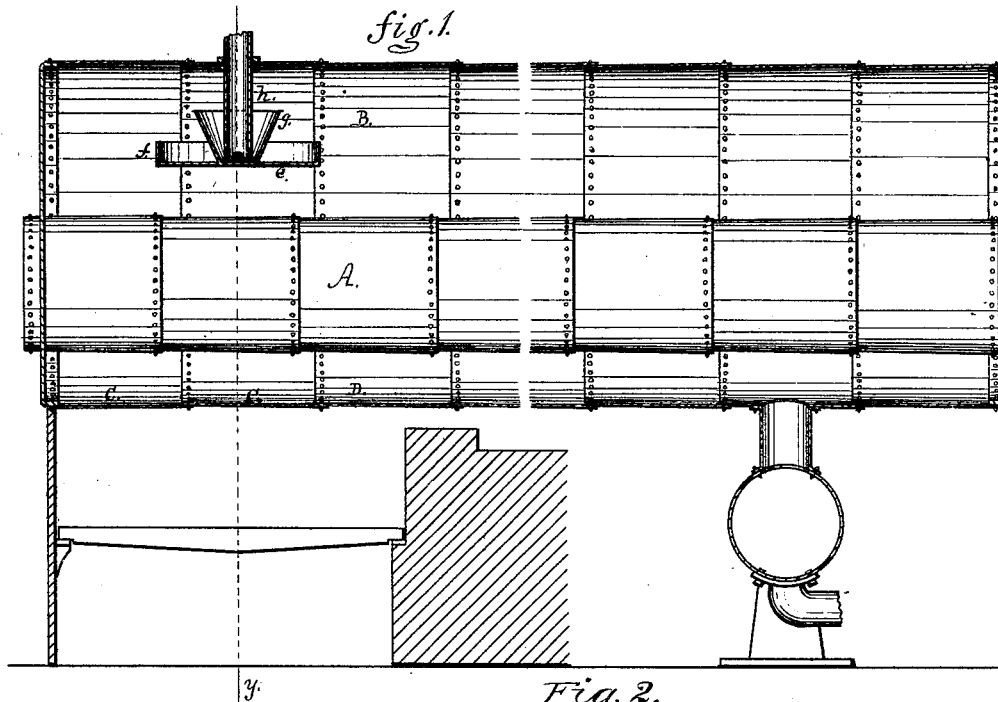


B. FORD.
Water Supply and Heater for Steam-Boilers.
No. 220,598. Patented Oct. 14, 1879.



Witnesses

Geo. J. Turner
Wm. A. Turner

Inventor

Benjamin Ford
By J. J. Johnston
his attorney.

UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN WATER SUPPLY AND HEATER FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **220,598**, dated October 14, 1879; application filed June 18, 1879.

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 Water Supply and Heater 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.

The nature of my invention consists in supplying water to the steam-boiler through the medium of the apparatus hereinafter described, said apparatus being suspended in the steam-space of the boiler, and directly over the fire-chamber, whereby the earthy matter in the water is separated from it and deposited at a point in the boiler which is most distant from the "fire-sheets," thereby preventing the warping and burning of said fire-sheets, and lessening the danger of explosion, and the wear incident to the working of the steam-boilers.

To enable others skilled in the art with which my improvement 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 longitudinal section of my improvement in water supply and heater for steam-boilers. Fig. 2 is a transverse section of the same at line *y* of Fig. 1.

In the accompanying drawings, A represents an ordinary steam-boiler, which may be furnished with all the appendages common to such boilers. Within the boiler A, in the steam-space B, and directly over the fire-sheets C D, is suspended the water heater and distributing apparatus, which consists of the flanged disk *e*, the flange *f* of which projects upward, so that said disk and its flange form a dish, from the center of which project, in an upward direction a flange, *g*, forming a dish within a dish, the inner dish being much less in its diameter at its bottom than at its top, and less in diameter than the outer dish formed by the disk *e* and flange *f*.

This water heating and distributing apparatus is suspended through the medium of a pipe, *h*, to the crown of the boiler A, the pipe *h* being arranged centrally within the dish formed by the flange *g*, and the lower end of said pipe furnished with a large opening. The

pipe *h* communicates with the water-supply pipe of the boiler.

The skillful mechanic will readily understand the construction and arrangement of the hereinbefore-described apparatus for supplying and heating the water in supplying boilers.

I will proceed, therefore, to describe its operation. The water, being forced into the pipe *h*, enters the space or dish formed by the flange *g*, and, rising up, flows over the upper edge of the flange *g*, and falls in a thin circular sheet into the dish formed by the disk *e* and flange *f*, and, rising up in it, said dish, flows over the upper edge of the flange and commingles with the steam, so as to be properly heated before mixing with the water in the boiler.

By means of the apparatus hereinbefore described, and located in the boiler at the point stated, and indicated in the accompanying drawings, the earthy matter will be separated from the water and collected in the dish formed by disk *e* and flange *f*, and that part of the earthy matter which is not collected in said dish will be carried by the currents formed in the boiler to that point which is most distant from the fire-sheets C D, thereby lessening the danger of burning the boiler, caused by earthy deposits on and over the fire-sheets.

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

1. In a steam-boiler, the hereinbefore-described apparatus for heating feed-water and distributing it at a point above the sheets of the boiler over the fire-grate, whereby a current of water is formed, flowing from the front to the rear of the boiler, in combination with a mud-drum, arranged substantially as and for the purpose specified.

2. The feed-water-heating apparatus consisting of the flanged disk *e*, attached to the feed-water pipe *h*, with a circular flange, *g*, projecting from the end of said pipe upward and outward above the top edge of the flange *f* of disk *e*, whereby feed-water flows upward and over the top edge of flange *g* in a thin circular sheet upon the disk *e*, and rising and flowing over the top of flange *f*, substantially as and for the purpose herein shown and described.

BENJAMIN FORD.

Witnesses:

GEO. F. TURNER,
FRED. F. TURNER.