W. B. Cross,

Steam-Boiler Water-Heater.

No. 50,459. Patented Oct. 17, 1865.

Fig. 1

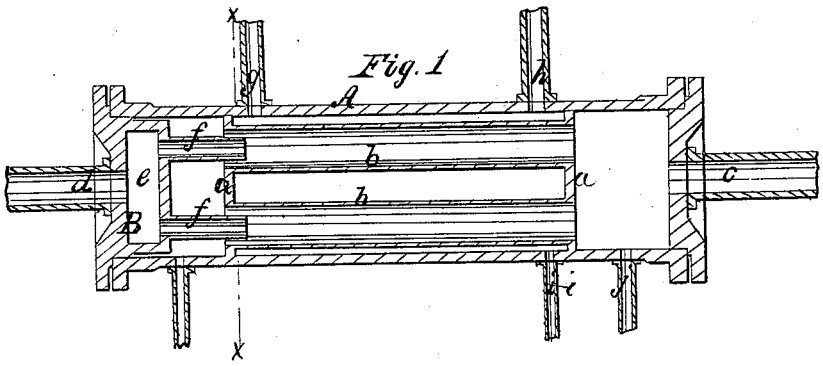


Fig. 2

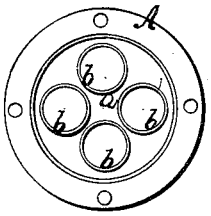
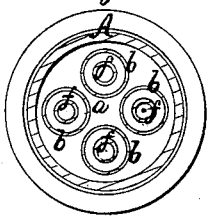


Fig. 3



Witnesses.
Wm. Treurn
Thos. Tusch

Inventor.
Wm B Cross
By Munn & Co

UNITED STATES PATENT OFFICE.

WILLIAM B. CROSS, OF SACRAMENTO CITY, CALIFORNIA.

IMPROVEMENT IN FEED-WATER HEATERS.

Specification forming part of Letters Patent No. **50,459**, dated October 17, 1865.

To all whom it may concern:

Be it known that I, WILLIAM B. CROSS, of Sacramento City, in the county of Sacramento and State of California, have invented a new and Improved Feed-Water Heater; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a longitudinal central section of this invention. Fig. 2 is an end elevation of the same when the head is removed. Fig. 3 is a transverse section of the same, the line *x x*, Fig. 1, indicating the plane of section.

Similar letters of reference indicate like parts.

The object of this invention is to facilitate the operation of cleaning out a feed-water heater in which the feed-water passes through a series of tubes arranged side by side in a chamber which is heated by the exhaust-steam of the engine. In the interior of these tubes the water, particularly if it carries many foreign parts, is liable to leave a deposit, which obstructs the passage of the water and sometimes interrupts the operation of the apparatus.

The apparatus which forms the subject-matter of this present invention is composed of a series of small pipes projecting from the interior of a chambered head into the water-pipes in combination with a supply and a discharge pipe in such a manner that by opening said supply and discharge pipes a current of hot water from the boiler is injected in each of the water-pipes of the apparatus, and by the action of this water all the sediment which may have collected in said pipes is readily blown out and the apparatus is cleaned in a short time and without interrupting the operation of the engine.

A represents a box or case, which is made of sheet iron or any other suitable material in the form of a cylinder or in any other convenient form. It is closed at its ends by two heads, B C, and at a certain distance from said heads it is provided with transverse partitions *a*, which support the water-tubes *b*. The water to be heated is introduced through a suitable pipe in the shell A, and after passing through the tubes *b* it enters the boiler through a pipe, *c*, connecting the same with the head C. The head B connects with the boiler by a pipe, *d*, and said head is provided with a chamber, *e*, and from its inner plate extend a series of short nozzles, *f*, one into each of the water-tubes *b*. The exhaust-steam passes in through the pipe *g* and out through the pipe *h*, and the pipe *i* serves to discharge the condensed water from the case A. The mud or sediment which may collect in the tubes *p* is blown out through the pipe *j*.

If it is desired to clean the apparatus, the mud-pipe *j* is first opened and then the check-valve in the pipe *d* is raised, so that a current of water from the boiler is injected into each of the tubes *b* through the nozzles *f*. By this current of heated water all the sediment which may have collected in the tubes *b* is blown out in a short time, and by closing the mud-pipe and letting down the check-valve the apparatus is again in working order. This whole operation can be carried out without stopping the pump or interfering in any way with the motion of the engine, and the boiler can be regularly supplied with water heated by being passed through the tubes in the box A.

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

The chambered head B, with nozzle *f*, in combination with the tubes *b* and box or case A, constructed and operated substantially as and for the purpose described.

WILLIAM B. CROSS.

Witnesses:

SAMUEL CROSS,

THOS. H. AUSBROW.