J. Nicholson,

Steam-Boiler Condenser.

No. 54,940. Patented May 22, 1866.

Fig. 1.

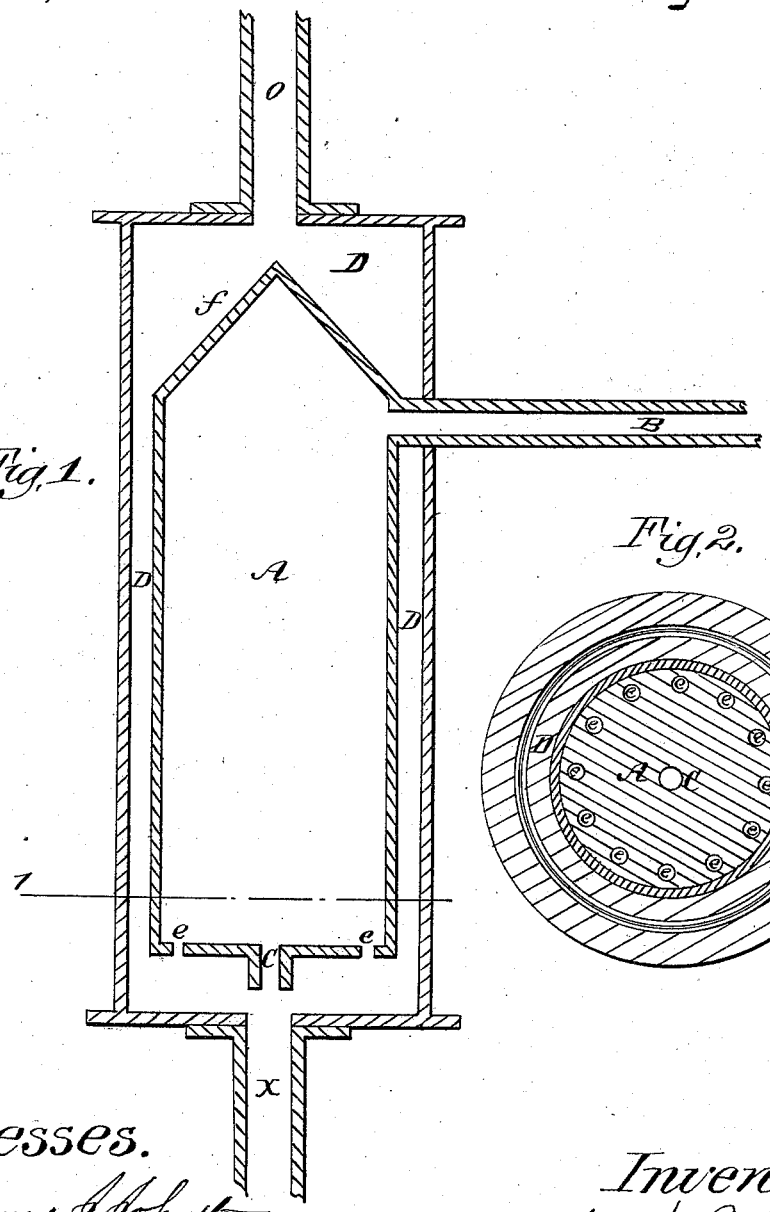

Fig. 2.

Witnesses.

James F. Johnston.

John Walsh.

Inventor.

John Nicholson

UNITED STATES PATENT OFFICE.

JOHN NICHOLSON, OF ALLEGHENY CITY, PENNSYLVANIA.

IMPROVEMENT IN FEED-WATER HEATERS.

Specification forming part of Letters Patent No. **54,940**, dated May 22, 1866.

To all whom it may concern:

Be it known that I, JOHN NICHOLSON, of the city and county of Allegheny, and State of Pennsylvania, have invented a new and useful Improvement in Water-Heaters for Steam-Boilers; and I do hereby declare that the following is a full 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 a steam-chamber furnished with an inlet and outlets for steam, and placed within a water-chamber which is connected to the steam-boiler and the supply of water by means of suitable pipes, the whole being constructed and arranged substantially in the manner hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawings, Figure 1 represents a longitudinal section of my improved water-heater for steam-boilers. Fig. 2 represents a transverse section of the same cut through at line 1.

In the drawings, A represents the steam-chamber, which is furnished with an inlet, B, for steam. This inlet or pipe is connected to the steam-boiler and is furnished with a suitable valve for regulating the admission of the steam into the chamber A. The upper end (marked *f*) of the steam-chamber A is made coniform, so that the water in entering the water-chamber D will be distributed evenly around the sides of the steam-chamber.

The bottom or lower end of the steam-chamber is furnished with a short pipe, (marked C,) which is placed in the center of the bottom of the chamber, and so arranged that it will come directly over the pipe (marked X) of the water-chamber.

Around the outer edge of the bottom of the steam-chamber are a number of small openings, (marked *e*.)

The space which forms that part of the water-chamber which surrounds the sides of the steam-chamber A should be made very narrow, so as to form a thin sheet of water, so that it can be heated with rapidity as it passes down the sides of the steam-chamber.

The pipe *o* is connected to the ordinary injector now used for supplying boilers with water; or it can be, when so desired, connected to any device for supplying the chamber D with water.

The pipe X is connected in a suitable manner to the steam-boiler or to the stand-pipe; or it may, if so desired, be attached to the force-pump used for forcing water into the boiler.

The manner of constructing and the relation that the several parts of my improved heater bear to each other will readily be understood by the skillful mechanic. I will, therefore, proceed to describe its operation. Water is forced into the chamber D by the ordinary injector, and steam is admitted into the chamber A through the pipe B, which will heat the water as it passes down the sides of the chamber; and after it has performed its office in heating the water, it will pass out through the openings *e* and pipe C, and assist in forcing the water into the boiler.

The advantages of my improved heater are as follows: First, a constant, regular, and uniform action of the injector is obtained; second, supplying the boiler with hot water when the injector is used as a means for forcing water into the steam-boiler, all of which is very desirable and very useful.

Having thus described the nature, construction, and operation of my improvement, what I claim as of my invention is—

The steam-chamber A, furnished with an inlet, B, and outlets C and *e* for steam, and placed within a water-chamber, D, which is connected to the steam-boiler by pipe X and to the supply of water by pipe *o*, the whole being constructed, arranged, and operating substantially as herein described, and for the purpose set forth.

JOHN NICHOLSON.

Witnesses:

JAMES J. JOHNSTON,
ALEXANDER HAYS.