W. F. SHAW.

Heaters for Steam Fire-Engines.

No. 142,589. Patented September 9, 1873.

Fig. 1

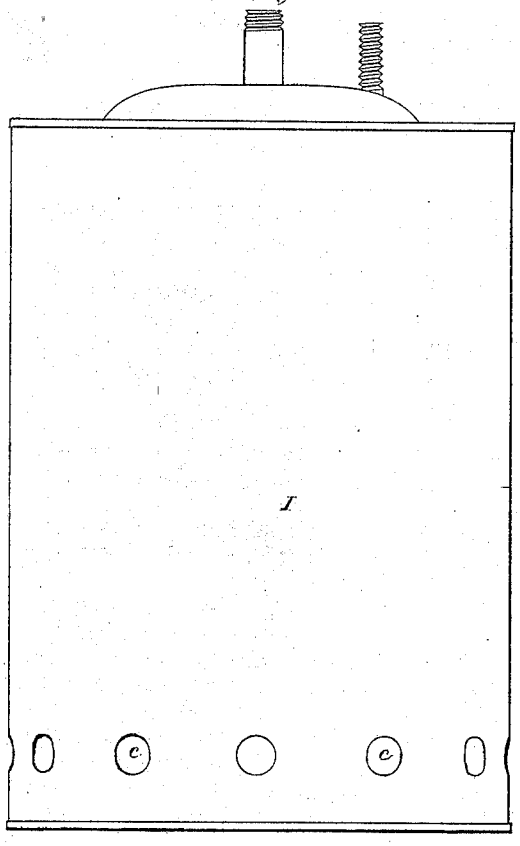


Fig. 2.

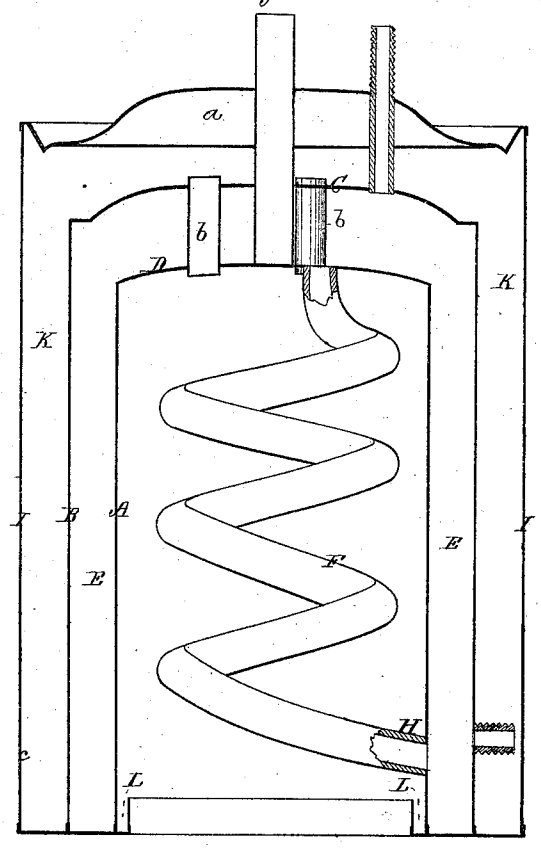
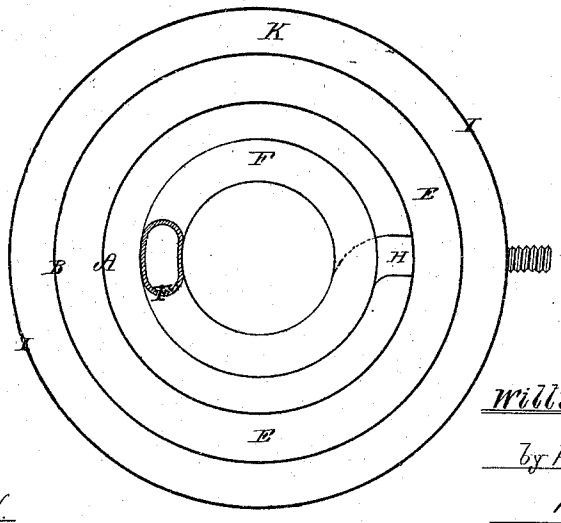


Fig. 3.



Witnesses.
S. N. Piper
L. N. Miller.

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by his attorney.
R. H. Eddy

UNITED STATES PATENT OFFICE.

WILLIAM F. SHAW, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND DAVID SHARP, OF SAME PLACE.

IMPROVEMENT IN HEATERS FOR STEAM FIRE-ENGINES.

Specification forming part of Letters Patent No. **142,589**, dated September 9, 1873; application filed August 13, 1873.

To all whom it may concern:

Be it known that I, WILLIAM F. SHAW, of the county of Suffolk and State of Massachusetts, have invented a new and useful Water-Heater for Steam Fire-Engines; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 denotes a front elevation, Fig. 2 a vertical and transverse section, and Fig. 3 a horizontal section, of it.

In October 22, 1872, a patent (No. 132,488) was granted on a water-heater for fire-engines, the inventor being Alfred H. Perry. In carrying out my invention I have combined with such water-heater an external case and concentric heating-chamber, the case being provided with a chambered head. I have also provided the inner or coil chamber with an annular trough, arranged at its lower part, and to intercept any condensed vapor or product of combustion that may gather upon the inner vertical surface of the chamber, and fall or run down therefrom.

In the drawings, A and B denote two concentric cylinders, provided with domed tops C D, and arranged so that there may be a concentric water-holding space, E, between the cylinders, and also between their tops, as shown. Within the inner cylinder A is a coil or helical tube, F, it being arranged as represented, and having its extremities opening into the water-space, which, at top, has an educt or pipe, G, and at bottom an induct or pipe, H, all of which is substantially like the water-heater constituting the subject of the said patent, and is to be heated by a lamp or burners arranged within or directly under the cylinder A.

I have encompassed such water-heater by a concentric case, I, to extend around and over it, as represented, and so that there may be a chamber or space, K, between the two, it extending over and around the water-heater. This case I may be provided with a chamber, *a*, within its upper part or top, to contain air, and prevent waste of heat. There are to be sundry pipes *b b*, leading from the heating or coil chamber within the water-heater up into the outer heating-chamber K, the latter, at or near its bottom, being provided with sundry educts or holes *c c* for escape of the smoke or spent volatile products of combustion. At the bottom of the inner heating-chamber is the concentric trough L, which extends around the chamber and serves to intercept any of the products of combustion that may gather on the inner surface of the sides of the heating-chamber and fall therefrom, the object of the trough being to prevent such products from getting on the floor or supporter of the water-heater and soiling it.

I sometimes form the outer case of two concentric cylinders, with an air-space between them.

In the operation of my new water-heater, the heat and volatile products of combustion from the flame of the burner placed at the base of the heater, after circulating in contact with the coil and inner surface of the inner chamber, escape by the pipes *b* into the outer heating-chamber K, and thence flow down outside of the water-holding vessel, and heat it, the spent products escaping by the holes *c*.

The water-vessel, when the apparatus is in use, is to be connected by pipes at top and bottom with a boiler, the whole being so that water from the latter may flow into the chamber E at bottom, and back out of it at top, such water being heated while passing through the space or vessel E.

My additions to the patented water-heater effect a material saving in fuel or gas, and for heating the water.

I claim—

1. The combination of the external heating-chamber K and one or more pipes, *b*, with the coil F and water-holding vessel or space E, arranged and connected, as described, all being for use and to operate essentially as set forth.

2. The water-heater, as provided with the intercepting-trough L arranged in it, as and for the purpose substantially as specified.

W. F. SHAW.

Witnesses:
R. H. EDDY,
J. R. SNOW.