R. H. SHULTIS.

FEED-WATER HEATER.

No. 185,266. Patented Dec. 12, 1876.

Fig. 2.

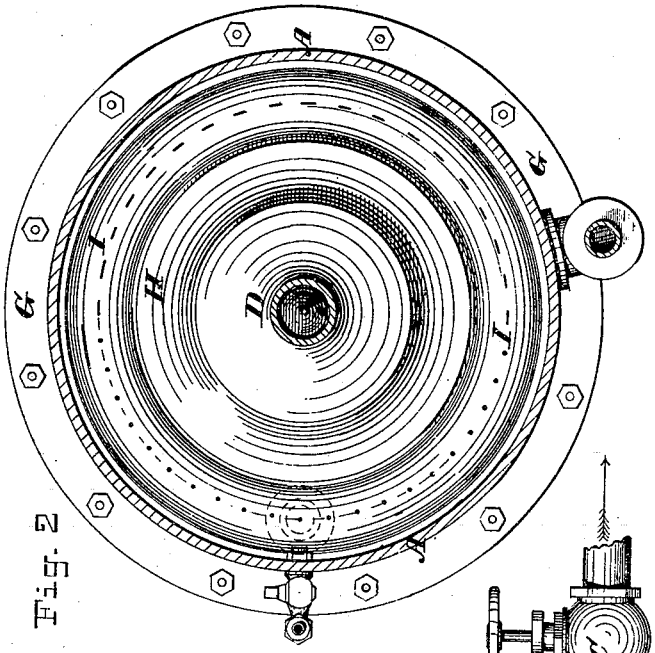
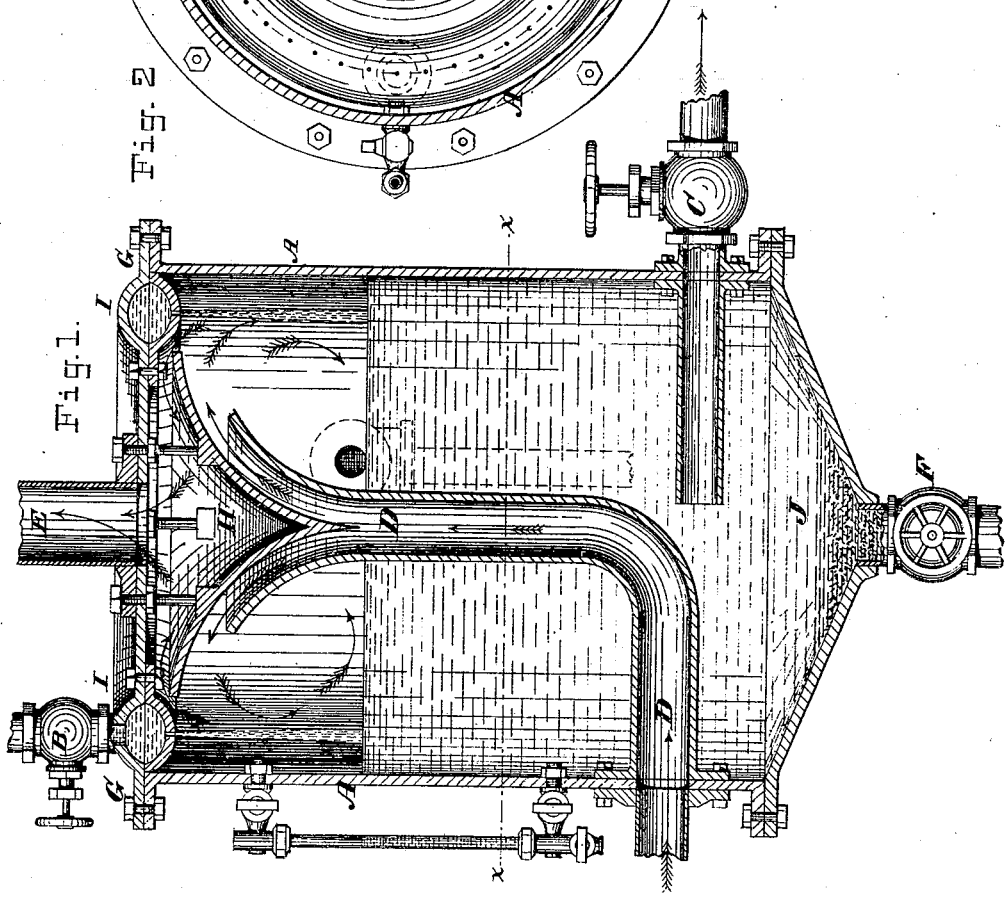


Fig. 1.



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ROBERT H. SHULTIS, OF NEW YORK, N. Y.

IMPROVEMENT IN FEED-WATER HEATERS.

Specification forming part of Letters Patent No. **185,266**, dated December 12, 1876; application filed July 20, 1876.

To all whom it may concern:

Be it known that I, ROBERT H. SHULTIS, of the city, county, and State of New York, have invented certain Improvements on Feed-Water Heaters, of which the following is a specification:

This invention relates more especially to what are called "open" heaters for high-pressure boilers, the object sought being the avoidance of back-pressure, and the more perfect contact of the feed-water and the exhaust steam.

My invention consists in the combination of a water-distributing cap at the top of a feed-water heater, provided with an annular sprinkler near the outer edge or periphery thereof, and with a central steam-escape pipe, of a conical or flared steam-deflector, to direct the steam first close out to the sprinkler-pipe, and thence inward to the escape-pipe, and the exhaust-steam pipe, flared at the top to partially inclose or surround the center or apex of the deflector; also, in the peculiar construction of the annular sprinkler, all substantially as hereinafter specified.

In the drawings, Figure 1 is a vertical mid-section of a heater embodying my improvements. Fig. 2 is a horizontal section of the same in the plane of the line *x x*, Fig. 1, the view showing the upper half of the heater.

Let A represent the cylindrical body of an ordinary feed-water heater; B, the feed-water inlet; C, the feed-water outlet; D, the exhaust-pipe from the engine; E, the escape-pipe, and F the outlet for the sediment.

In the precise construction shown, the exhaust-pipe D is carried in to about the center of the heater, and then turned upward, the upper extremity being flared or trumpet-shaped, as shown. From the cap G of the heater, directly over the flared mouth of the exhaust, is suspended a correspondingly cone-shaped deflector, H, arranged concentrically therewith. This arrangement serves to throw the spent steam outwardly all around, so that it impinges fully and directly upon the feed-water entering the heater through apertures in an annular sprinkler, I. This sprinkler is shown as formed partly in the cast-iron cap G and partly in a casting bolted thereto. This I consider a good method of construction, as it avoids a core in casting. It may, however, be an annular pipe, distinct from the cap, but arranged with reference to the exhaust, substantially as shown.

The manner of constructing and putting together the parts above described may be varied without departing from my invention; and I do not confine myself to precisely that shown.

I am aware that sprinklers for admitting feed-water, in connection with an exhaust-pipe arranged to throw the spent steam upon the said sprinklers, is a very old device in heaters and condensers, and I make no claim to this. These have generally been constructed, however, in such a manner that only a part of the steam comes in contact with the feed-water, and the condensed steam and water from the supply-pipe are apt to get into the exhaust, and pass thence to the cylinder of the engine. More than this, the impinging of the steam against the sprinkler-pipe, and the concave plate usually placed above it, serves to produce back-pressure on the engine.

In my improved construction the steam is deflected and spread without appreciable loss of force, and every part of it is brought into direct contact with a cylindrical sheet of falling feed-water, while it does not touch the sprinkler-pipe at all.

The ordinary heaters, as now constructed, have flat bottoms, and no suitable provision is made for the reception and removal of the large quantities of mud and other sedimentary matter liable to collect in heaters where muddy and impure waters are used. To remedy this I provide the heater with a conical or hopper-shaped bottom, J, having an outlet or blow-off pipe, F. When the cock or valve in this pipe is opened, the downward pressure of the water, assisted by the funnel shape of the bottom, readily forces out the accumulated sediment without for a moment disarranging the operation of the heater.

Where a hand-hole at the side is employed for this purpose, as in the ordinary heater, the engine must be stopped while the sediment is being removed.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the cap G, provided with an annular sprinkler, I, and central escape-pipe E, the deflector H, situated concentrically with the said cap, and reaching nearly to the annular sprinkler, and the exhaust-pipe D, concentric with and partially surrounding the said deflector, all substantially as and for the purpose herein specified.

2. The annular sprinkler I, constructed as shown, one half in the cap G of the heater, and one half made separate, perforated, and bolted thereto, as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

R. H. SHULTIS.

Witnesses:
ARTHUR C. FRASER,
HENRY CONNETT.