

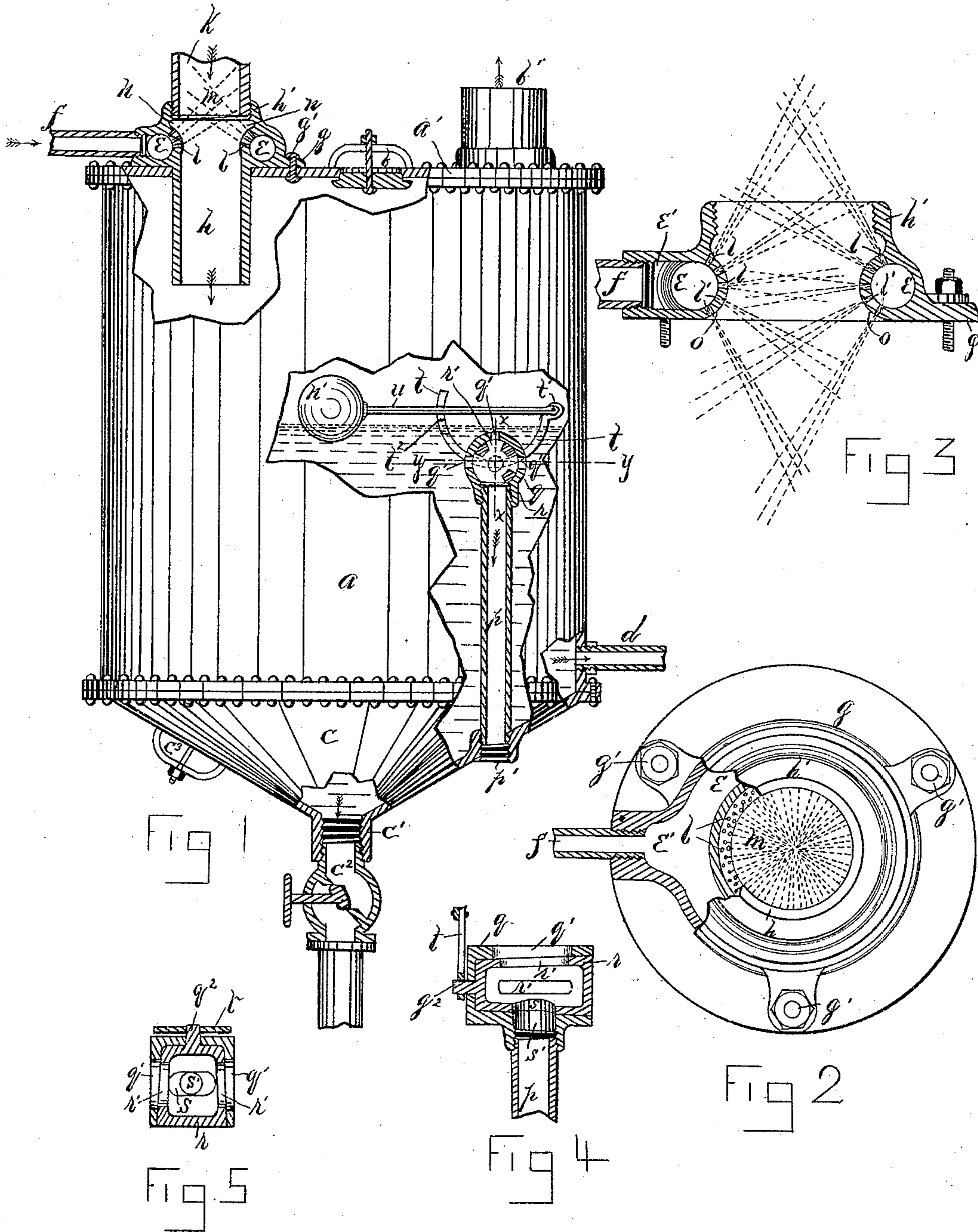
(No Model.)

G. W. SHAMP.

FEED WATER HEATER AND PURIFIER.

No. 283,823.

Patented Aug. 28, 1883.



Witnesses:
Otto Hedrick
Wm. W. Kent.

Inventor:
George W. Shamp
By W. T. Miller
Atty

UNITED STATES PATENT OFFICE.

GEORGE W. SHAMP, OF BUFFALO, NEW YORK.

FEED-WATER HEATER AND PURIFIER.

SPECIFICATION forming part of Letters Patent No. 283,823, dated August 22, 1883.

Application filed November 29, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. SHAMP, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Feed-Water Heaters and Purifiers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates more particularly to that class of devices connected with feed-water heaters and purifiers, by means of which the feed-water is commingled with the steam and thereby heated and purified; and it consists, broadly, in means for forcing the feed-water into the steam-passage from the inner circumference of such steam-passage toward its center, wherein it meets the incoming steam, and is forced with such steam into the body of the heater through the unobstructed steam-passage.

In the drawings, Figure 1 is an elevation of a feed-water heater and purifier, partly in section, and with portions broken away to show my improved construction. Fig. 2 is an enlarged top plan view of my improved commingling device, partly in section. Fig. 3 is a sectional elevation of a modified form of commingling-chamber. Fig. 4 is a sectional detail view taken in the line *x x* of Fig. 1, and Fig. 5 is a sectional detail view taken in the line *y y* of Fig. 1.

Referring to the drawings, *a* is the cylindrical body of the heater, across the flanged top of which is secured the cover *a'*, provided with usual arm-hole, *b*, and exhaust-pipe *b'*.

To the flanged bottom of the cylindrical portion *a* is secured the inverted cone-shaped bottom *c*, having the outlet *c'* located at its apex. In this outlet is secured the globe-valve *c''*, which permits of the discharge of the impurities collected in the bottom of the heater.

c'' is an arm-hole in the side of the portion *c*, and *d* is the outlet-pipe which conveys the heated and purified water to the boiler.

The parts thus far described are of ordinary construction and arrangement, and form no part of my invention.

I will now proceed to describe the simplest form in which I have thus far constructed my improved commingling-chamber, it being understood that it is susceptible of considerable variation without departing from the broad spirit of my invention, which consists, as before stated, in forcing the feed-water in the form of a spray or sheet from the inner circumference of the steam-passage toward its center.

I have preferably located my improved commingling-chamber upon or near to the top plate, *a'*, of the heater. It consists of an annular chamber or passage, *e*, having the opening *e'*, into which the pipe *f*, which conducts the water to the heater, is secured. This annular chamber *e* is provided with the flange *g*, by means of which it is secured by the bolts *g'* to the top plate, *a'*. Extending from the chamber *e* downwardly through an opening in the top plate, *a'*, is the pipe *h*, which forms a continuation of the steam-passage, and is of a diameter equal to the inner diameter of the annular chamber *e*. *h'* is a circular screw-threaded extension above the annular chamber *e*, and in line with the pipe *h*. Into this extension is secured the pipe *k*, which carries the exhaust-steam from the boiler to the heater. This steam-pipe *k* is preferably of the same diameter as the pipe *h*, and it will thus be seen that the passage through which the steam passes into the heater is entirely unobstructed. The curved inner surface of the annular chamber *e* is provided along its entire circumference with a series of holes or perforations, *l*, opening into the steam-passage; but instead of these holes *l* a series of narrow slots might be made. The holes *l* are preferably inclined upwardly, as shown in Fig. 1.

The operation of the commingling-chamber just described is as follows: The water to be heated is admitted through pipe *f* into the annular chamber *e*, surrounding the steam-passage, and passes through the holes or perforations *l* into the steam-passage in an upward direction in the form of a spray or sheet, as clearly shown at *m*, Figs. 1 and 2, where it

meets the steam coming in through the pipe *k*, and is commingled, heated, and carried down therewith into the body of the heater. It will be noticed that the inner wall of the annular chamber *e* is carried back concentrically a short distance, forming the annular recess *n*, and giving a larger surface in which to form the openings for the passage of the water.

By this improved construction the steam and water are admitted to the heater in a direct and unobstructed manner, and the water is thoroughly and quickly heated and purified. It might be found advantageous in some instances to locate the annular water-chamber *e*, surrounding the steam-passage, at some distance above or away from the heater, and to have the sprays or sheets of water thrown into the steam-passage both in an upward and downward direction. I have therefore shown in Fig. 3 a modification applicable to the above-named requirements, in which I have omitted the cylindrical extension *h* and rounded off the lower edge of the opening, as shown at *o o*, providing at the same time additional perforations, *l'*, by means of which, with the perforations *l*, the water is thrown into the steam-passage both in an upward and downward direction, as clearly shown in dotted lines. Its flange *g* adapts it to be secured to a corresponding flange in the exhaust-steam pipe at any point

I claim—

1. In a feed-water heater and purifier, an unobstructed steam-passage leading into the body of the heater, such steam-passage being surrounded by a water-chamber communicating with the interior of the steam-passage, whereby the water is admitted to such steam-passage from its inner circumference, substantially as shown and described.

2. In a feed-water heater and purifier, the commingling device, consisting, substantially, of the annular chamber *e*, surrounding the steam-passage, and having the opening *e'*, through which the water is admitted; and the perforations *l*, through which the water is thrown from the inner circumference of the steam-passage toward its center to meet the incoming steam, the annular chamber *e* being connected with the exhaust-steam pipe and with the heater, substantially as shown, so that the commingled steam and water passes into the heater through an unobstructed passage, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE W. SHAMP.

Witnesses:

A. M. WESTFALL,
W. T. MILLER.