

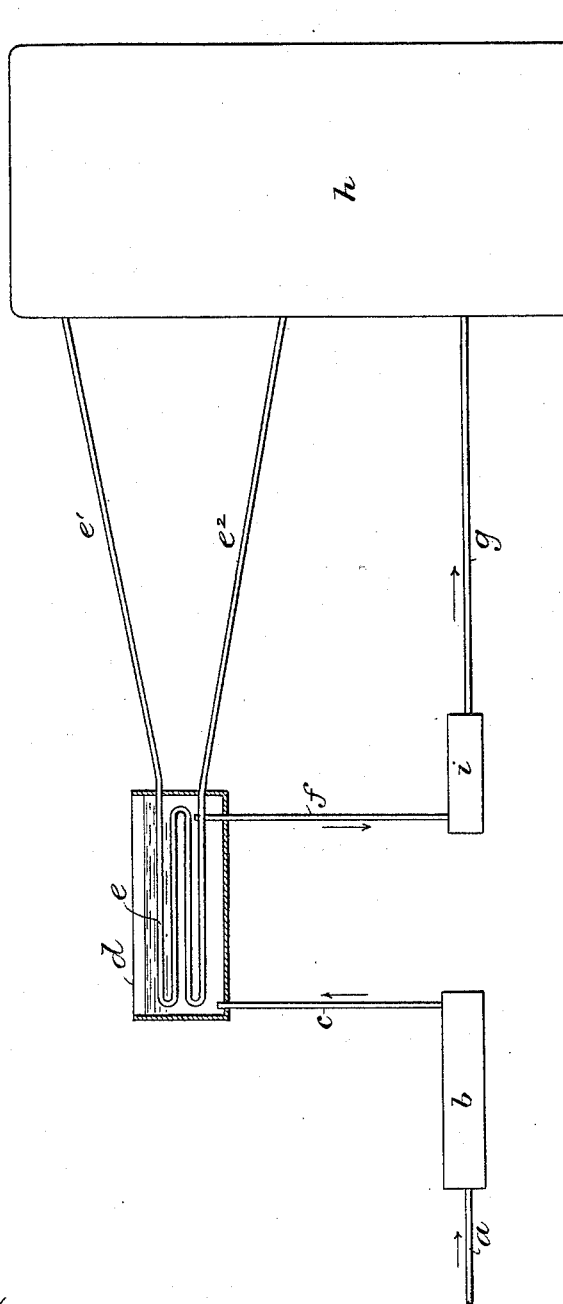
(No Model.)

F. G. FOWLER.

PREPARING FEED WATER FOR STEAM BOILERS.

No. 423,423.

Patented Mar. 18, 1890.



Witnesses

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FRANK G. FOWLER, OF BRIDGEPORT, CONNECTICUT.

PREPARING FEED-WATER FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 423,423, dated March 18, 1890.

Application filed November 3, 1888. Serial No. 289,901. (No model.)

To all whom it may concern:

Be it known that I, FRANK G. FOWLER, of Bridgeport, in the State of Connecticut, and a citizen of said State, have invented a new and useful Improvement in Preparing Feed-Water for Steam-Boilers, of which the following is a specification.

In Letters Patent No. 346,198, granted to me July 27, 1886, I have described a process upon which the process which is the subject of the present application is an improvement. In said patent the gases were removed from the water before it was used to produce steam, so as to obviate the explosive and corrosive effect due to the presence of gases.

My present invention consists, also, in removing the gases from the water, but by a far simpler and less expensive process.

In the accompanying drawing I have shown by a diagram a general arrangement of apparatus by which my invention can be practiced; but it should be understood that I do not limit myself to the form or arrangement of apparatus described, since I believe my invention to be broader than any form of apparatus and to be capable of embodiment in a variety of forms.

a is a pipe for the feed-water, communicating with the well or hydrant, which may be conducted through the heater *b*, which will partially heat it—say from 140° to 200° Fahrenheit. It is thence conducted through the pipe *c* into the tub *d*, which is provided with a source of heat in excess of what would be required to bring its contents to a boiling-point, and sufficient to maintain a constant boiling of the water as it passes through the tub, whereby the contained gases are effectually expelled from it. This source of heat may be supplied as by means of the worm *e*, which is supplied by the pipes *e'* and *e''* with live steam from the boiler, or by the application of a furnace direct to the base of the tub.

The tub is not provided with a cover, and therefore its contents communicate freely with the open air; or, if provided with a cover, there must be an aperture, so as to provide a free communication between the surface of the water and the external atmosphere, thereby permitting the gases which are expelled by the boiling operation to separate from the water and escape into the atmosphere. After

the expulsion of the contained gases from the water, as above described, the water is passed to the boiler *h* without coming in contact with the atmosphere, whereby the absorption of more gases is effectually prevented. That is accomplished by passing it through the closed pipe *f*, which communicates with the tub below the surface of the water, and through the pump *i* and tube *g*, which are closed and do not communicate internally with the atmosphere, and through these it is delivered to the boiler *h*. When the water enters the tub *d*, it will contain gases, with which it is always impregnated when exposed to the atmosphere. When boiled in the tub *d*, however, the gases will be expelled and driven into the atmosphere, and the water will be passed into the boiler without exposure to the atmosphere or liability to reabsorb other gases in the place of those which have been expelled, and in this condition it will be converted into steam in the boiler, securing comparative freedom from danger of explosion or corrosion.

In getting up steam for the first time after a boiler has been blown off and filled anew experience has shown there is great danger of severe explosions, and this is because the water in the boiler under such circumstances contains a maximum of gases, none having previously been expelled by boiling. This danger can be obviated by lifting the safety-valve when the steam begins to form, and allowing the boiler to blow for some time till the gases are expelled, and then by the application of my invention, which expels the gases from the feed-water, the boiler is preserved from all danger of explosion due to the presence of gases in the water.

I claim—

The process of obviating the explosion and corrosion of boilers, which consists of boiling the water while its surface is in free communication with the open air to expel the gases and preventing their reabsorption by passing the water to the boiler excluded from any contact with the atmosphere, substantially as described.

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Witnesses:

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