

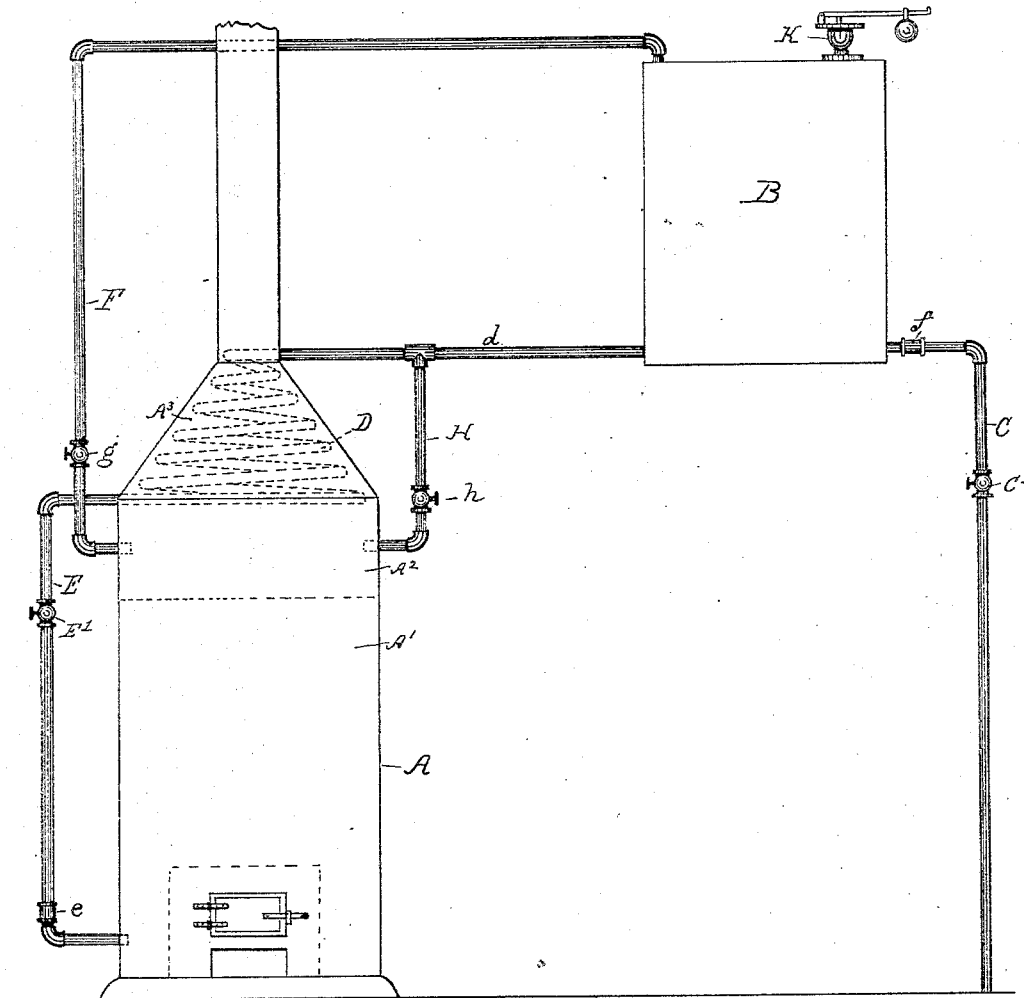
(No Model.)

T. J. PYNE.

FEED WATER HEATER.

No. 304,029.

Patented Aug. 26, 1884.



WITNESS:

*Geo. A. Sicken*  
*G. W. Emerson*

INVENTOR:

*Thomas J. Pyne*  
*W. H. Adams* Attorney.,

# UNITED STATES PATENT OFFICE.

THOMAS J. PYNE, OF SAN FRANCISCO, CALIFORNIA.

## FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 304,029, dated August 26, 1884.

Application filed October 2, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS J. PYNE, a citizen of the United States, residing in San Francisco, county of San Francisco, State of California, have made and invented certain new and useful Improvements in Feed-Water Heaters for Steam-Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing.

My invention relates to an apparatus for heating and feeding water to steam-boilers; and it consists in a certain novel construction, combination, and arrangement of parts constituting and producing an apparatus whereby feed-water is raised to a high temperature before being introduced into the circulation of the boiler, and is so introduced and fed without the use of a feed or a circulating pump.

The following description fully explains the nature of my said invention and the manner in which I proceed to construct, apply, use, and carry out the same, the accompanying drawing being referred to by figures and letters.

A represents a steam-boiler of any well-known construction, of which A' is the water-space, A<sup>2</sup> the steam-space, and A<sup>3</sup> the smoke box or chamber connected with the chimney.

B is a water tank or reservoir located conveniently near the boiler. A pipe, C, connects it with a suitable source of supply, either with or without a head or pressure. This pipe is controlled by a stop-cock or a check-valve. From some point on the lower part of the tank a small pipe, d, is led into the smoke-box of the boiler. In this space it is carried around in several coils or layers to form a heating-coil, D, and then passing out through the side of the shell it connects with a vertical feed-pipe, E, outside of the boiler. This latter pipe leads into the lower part of the water-space A'. A check-valve, e, permits flow of water in a downward direction only. From the steam-space A' of the boiler a steam-pipe, F, runs upward to the water-tank, where it is carried in at the top. It has a shut-off cock, g, to control the flow and

pressure of steam in the water-tank. A cold-water supply-pipe, H, provided with a shut-off cock, h, leads into the upper part of the water-space in the boiler from a point in the pipe between the tank and the heater-coil. The water-tank is provided with a weighted relief-valve, K, to prevent excessive pressure.

Now, as thus arranged, the operation of the apparatus is as follows: The tank having a supply of water, the feed-pipe d fills the coil-heater. In its passage through this pipe the temperature of the water is raised, so that, passing down through the pipe E, it enters the boiler as hot water. The cock E' regulates the feed through this pipe, and the check-valve e prevents back flow. Necessary pressure for circulation and flow of water from the tank against the pressure of the boiler-water is obtained by means of the equalizing-pipe F, through which the steam-pressure in the boiler is applied upon the water in the tank. When it is desired to take water into the boiler at normal temperature, the cold-water feed-pipe d is used. To refill the tank B, the cock g in the equalizing-pipe F is shut, and the steam then in the tank being allowed to condense, the water rises in the pipe C, and, flowing past the check-valve f, fills the tank. In such manner feed-water is obtained at a high temperature, and is supplied to the boiler without the intervention of a feed-pump.

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

In a feed-water heater, the combination of the water-tank B and boiler A, discharge-pipe d, having the coil D in top of the boiler, and supply-pipe E, connecting the coil with the boiler A, in combination with the equalizing-pipe F, connecting the steam-space of the boiler with the tank B above the water-line, substantially as set forth.

Witness my hand and seal this 19th day of July, A. D. 1883.

THOMAS J. PYNE. [L. S.]

Witnesses:

G. W. EMERSON,  
GEO. A. DICKSON.