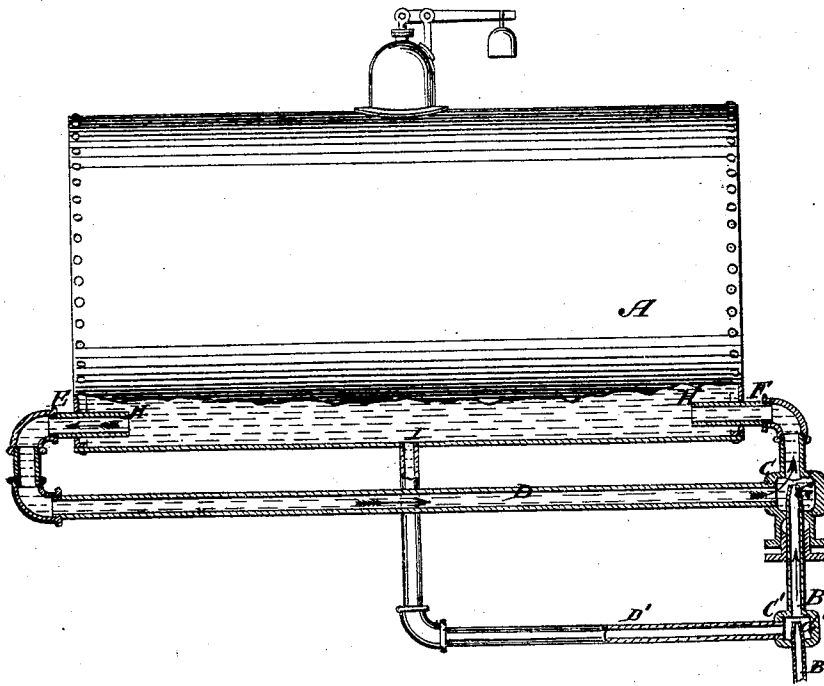


G. C. WILLIAMS.

Heaters and Feeders for Boilers.

No. 144,937.

Patented Nov. 25, 1873.



Witnesses.

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UNITED STATES PATENT OFFICE.

GARNER C. WILLIAMS, OF CATSKILL, NEW YORK.

IMPROVEMENT IN HEATERS AND FEEDERS FOR BOILERS.

Specification forming part of Letters Patent No. **144,937**, dated November 25, 1873; application filed January 25, 1873.

**To all whom it may concern:*

Be it known that I, GARNER C. WILLIAMS, of Catskill, in the county of Greene and State of New York, have invented a new and Improved Water Circulating and Heating Apparatus for Boilers, of which the following is a specification:

The invention will first be fully described, and then pointed out in the claim.

The drawing is partly a side elevation, and partly a sectional elevation, of a boiler, and a sectional elevation of the apparatus I use for inducing the circulation.

A is the boiler, which may be of any kind. B B' is the feed-water pipe, into which the pipes D D' enter at C and C', the pipe D being connected with the boiler at E, or at any point where the water may be supposed to be most quiet, and pipe D' being connected to the boiler at I. The water forced along the feed-pipe B B' past the junctions with pipes D D', naturally induces currents from the boiler at E and I by the friction of its particles with the particles of the water coming in at the other pipes, which, uniting with the feed-water, re-enters the boiler again along with it at F. To increase this action, I prefer to arrange a contrivance similar to the head of a steam siphon or injector at G; also, another at G', if I prefer, by which I can cause the passage of a volume through D' several times larger than the volume of the feed-water in B; also, a vol-

ume in D as much larger than the volume in B'; but this is not absolutely necessary, for, by enlarging the feed-pipe above the junction of the circulating-pipes, very good results may be obtained without the siphon-head. I prefer to have the feed-pipe and the pipe D extend into the boiler to some extent beyond the shell, as shown at H, as a further means of promoting the circulation; but this is not essential.

By this plan the water will constantly flow through the boiler and pipes, and a good circulation will be maintained; and, besides, the feed-water will be heated nearly to the degree of the water in the boiler, which is much greater than it can be heated by the ordinary feed-water heaters; and thus the boiler will be relieved to a greater extent than usual of the effects of the cold water on the hot surfaces.

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

The combination, with boiler-piping H E D E H, of the injection G and G', feed-pipe B inserted at C, and having its end projecting above that of boiler-pipe D and pipe D', as and for the purpose described.

GARNER C. WILLIAMS.

Witnesses:

A. P. THAYER,
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