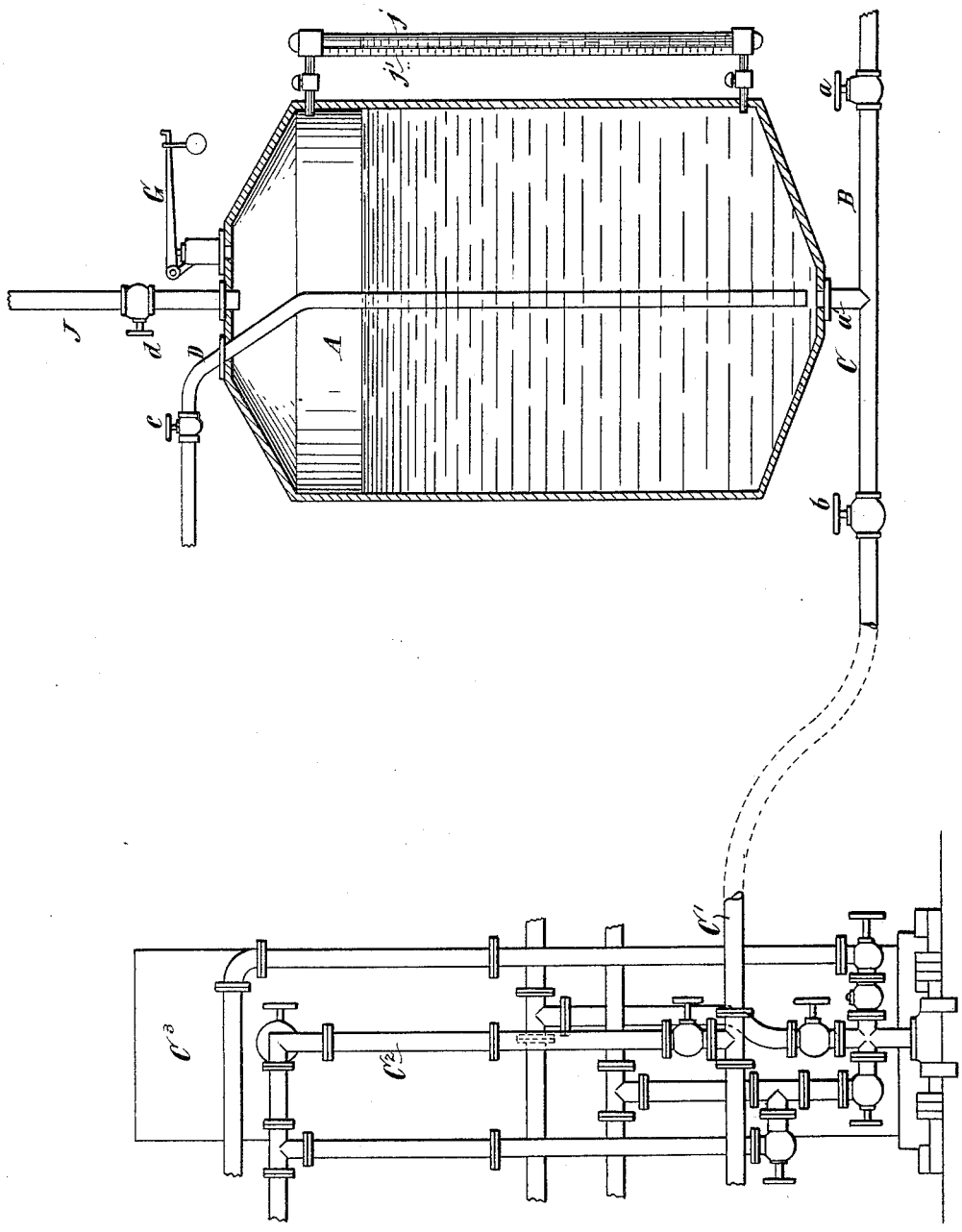
(No Model.)

F. J. OAKES.

FEED WATER HEATER.

No. 419,213. Patented Jan. 14, 1890.



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UNITED STATES PATENT OFFICE.

FRANCIS J. OAKES, OF ASTORIA, NEW YORK.

FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 419,213, dated January 14, 1890.

Application filed March 18, 1889. Serial No. 303,665. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS J. OAKES, of Astoria, Queens county, State of New York, have invented a certain new and useful Improvement in Feed-Water Heaters, of which the following is a specification.

I will describe a feed-water heater embodying my improvement in detail, and then point out the novel features in the claims.

The accompanying drawing illustrates a vertical section of a feed-water heater embodying my improvement, and showing the same connected to an extractor for dye-stuffs.

A designates a boiler. It is made of metal, and, as shown, is in the main cylindrical.

B designates a supply-pipe for cold water, in which is a cock *a*. This pipe communicates through a branch pipe *a'* with the boiler A, at the lower extremity of the latter.

C designates a discharge-pipe, in which is a cock *b*. This pipe also communicates with the boiler at the lower extremity of the latter, as shown, by means of the branch pipe *a'*.

D designates a steam-pipe, which enters the boiler near the top and extends downwardly within the same centrally to near the bottom of the boiler. This steam-pipe may receive steam from any suitable source. It is intended to supply steam for the purpose of heating the water in the boiler. A cock *c* in this pipe outside the boiler controls the admission of steam.

J designates another steam-pipe communicating with the interior of the boiler, near the top of the latter. As shown, it extends but a short distance within the boiler. This pipe may also receive steam from any desirable source, and its function is to supply steam for pressure to force the water from the boiler and through the discharge-pipe C. A cock *d* in this pipe controls the admission of steam.

I designates a water-gage communicating with the boiler near the top and bottom of the latter, as shown. It comprises a water-glass *j*, and a scored plate *j'*, to the rear of the water-glass; but it may be of any desired construction. By its use an exact quantity of water desired for any purpose may be introduced into the boiler.

G designates a safety-valve for the boiler, which may be of any desired kind.

The operation is as follows: The cocks *b c d* having first been closed, water is supplied to the boiler from the supply-pipe B in sufficient quantity, as indicated by the gage. The cock *a* is then closed, the cock *c* opened, and steam admitted to the boiler from the pipe D, by which means the water is soon very highly heated. When sufficiently heated, the cock *c* is closed and the cocks *d b* opened, when the steam-pressure from the pipe J will force the water out through the pipe C.

I have shown this feed-water heater as communicating with an extractor for dye-stuffs. This extractor is, as shown, of ordinary construction, and I will therefore give but a very brief description of the manner in which water is supplied to it. Water being forced from the discharge-pipe C passes into a pipe C', from which extends upwardly a branch pipe C^2. From the pipe C^2 the water passes into the extractor C^3, near the top of the latter. By this means very hot water may be supplied to the extractor, and the loss of time heretofore occurring in heating up cold water within the extractor is avoided.

Although I have shown the heater as connected to an extractor, I do not limit myself to its use in such connection, but claim it for use in any other way in which it may be found advantageous.

By my improvement I overcome the difficulty experienced in using pumps to force hot water.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a feed-water heater, the combination, with a boiler, of a supply-pipe, a discharge-pipe, a steam-pipe from which steam is supplied to heat the water in the boiler, and another steam-pipe from which steam is supplied to force water from the boiler, said pipe extending through and a short distance below the top of the boiler, substantially as specified.

2. In a feed-water heater, the combination, with a boiler, of a supply-pipe, a discharge-pipe, a steam-pipe extending to near the bottom of the boiler from which steam is supplied to heat the water in the boiler, another steam-pipe communicating with the boiler, near the top thereof, from which steam is supplied to force water from the boiler, and a water-gage, substantially as specified.

FRANCIS J. OAKES.

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