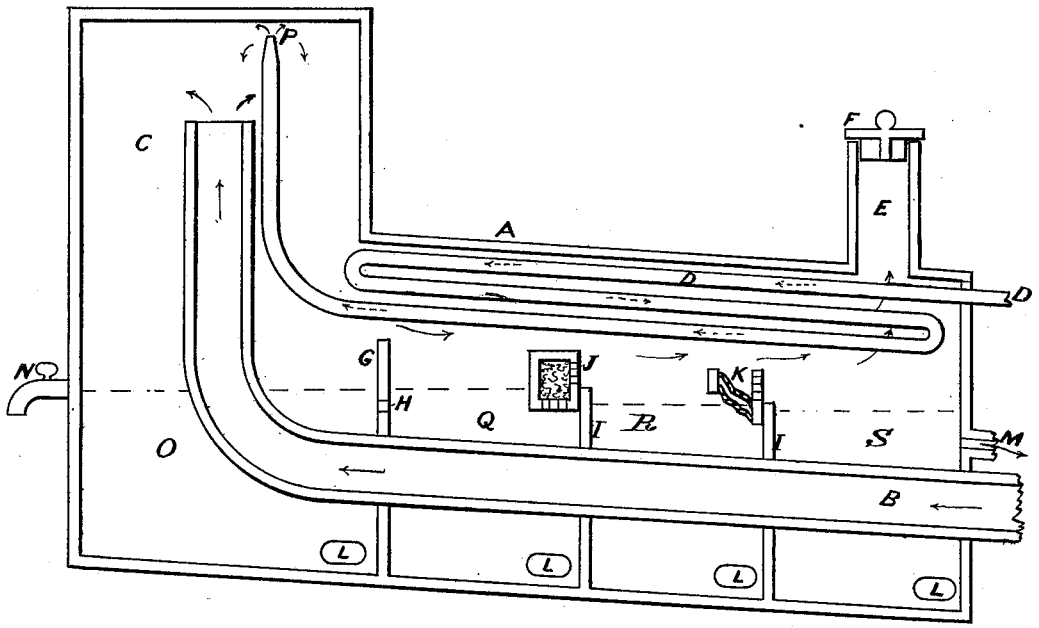
J. F. MORSE.

Feed Water Heater and Cleanser.

No. 196,988. Patented Nov. 13, 1877.



E. Palmer
Robert McCurdy
Witnesses

John F. Morse
Inventor

UNITED STATES PATENT OFFICE.

JOHN F. MORSE, OF OSHKOSH, WISCONSIN, ASSIGNOR OF ONE-HALF HIS RIGHT TO MARTIN T. BATTIS, OF SAME PLACE.

IMPROVEMENT IN FEED-WATER HEATERS AND CLEANSERS.

Specification forming part of Letters Patent No. **196,988**, dated November 13, 1877; application filed August 13, 1877.

To all whom it may concern:

Be it known that I, JOHN F. MORSE, of the city of Oshkosh, in the county of Winnebago and State of Wisconsin, have invented certain Improvements in Feed-Water Heaters and Cleansers, of which the following is a specification:

The object of my invention is to utilize the heat of the exhaust-steam to heat the water before it is introduced into the boiler, and at the same time to cleanse it of impurities, condensing, incidentally, a portion of the steam. I accomplish these results by the use of a horizontal, or nearly horizontal, tank, divided into chambers by partial partitions, each of which, except the first, has a strainer at its top, up through which the water must pass on its way toward the suction-pipe that leads it to the boiler. The sediment, being heavier than the water, will not rise through strainers, but will be precipitated to the bottom, where I provide for its removal. The partitions may or may not descend in height, as shown in the drawing; but the first partition should be higher than any others, and provided with perforations lower than the height of the next highest partition, for the passage of the water, so as to retain the oil which will be precipitated in that chamber, where I provide for its removal. The exhaust-steam is introduced by a pipe passing through these chambers, thus heating the water on its passage, and discharges into a raised chamber in the tank. The feed-water is introduced through a pipe more or less coiled, to give surface for the escaping steam to heat the inflowing water, while at the same time a portion of the steam is condensed and falls into the water-chambers below. After passing over this coiled pipe the steam escapes by a pipe provided with a valve weighted sufficiently to produce enough back pressure, say one or two pounds, to just raise the valve, so that the steam will escape by a steady flow, instead of in puffs, thus obviating the danger of blowing out the water.

A is the shell of the tank. B is the pipe by which the exhaust-steam is introduced, discharging into the raised chamber C, where it meets the feed-water. The feed-water is introduced by a pipe, D, coiled in the tank, and discharges through a contracted nozzle, P, the effect of which is to force the water in a jet against the cover of the chamber C, by which means it will be broken into spray, and falling through the steam, a portion of which it condenses, into the chamber O. The steam, on its way to the escape-pipe E, passes over the coiled feed-pipe, thus heating the water in it, while a further portion of the steam is condensed and falls into the water-chambers below.

The escape-pipe E has a free valve, F, weighted just enough to afford so much opening as will give an even discharge to the escaping steam. The oil brought in by the steam from the cylinders falls into the chamber O, where it floats on the surface of the water, and is drawn off at pleasure by a faucet, N.

The partition G is made higher than the others, so that the floating oil cannot overflow it; but passage for the water from O to Q is provided, by perforations H, below the surface of the water. At the top of the succeeding partitions, as I I, I place a strainer, which may be either a filter-box, J, or cloth or wire screens K. The filter-box is perforated only in the bottom and forward sides, so that the water must rise through the strainer to overflow the partition, and the sediment, being heavier, will not rise, and is precipitated to the bottom, whence it can be removed by opening the holes L L.

When screens K are used they should be so constructed as to pass the water relatively upward through them, substantially as shown in the drawing.

M is the suction-pipe by which the water is taken to the boiler.

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

The feed-water heater and cleanser, constructed with tank A, steam-pipe B, passing through the water-chambers O, Q, R, S, &c., formed by partial partitions G, having perforations H and I I, having strainers J or K, the steam-chamber C, the coiled feed-water pipe D, and contracted nozzle P, and the loose weighted valve F, all combined substantially as shown and described, for the purposes specified.

JOHN F. MORSE.

Witnesses:
C. PALMER,
ROBERT MCCURDY.