

JOHN GATES.

Improvement in Feed-Water Heaters.

No. 128,033.

Patented June 18, 1872.

Fig. 1.

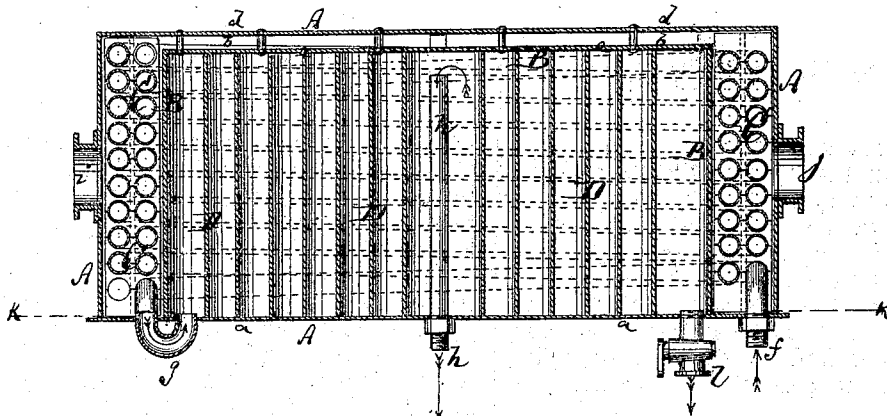
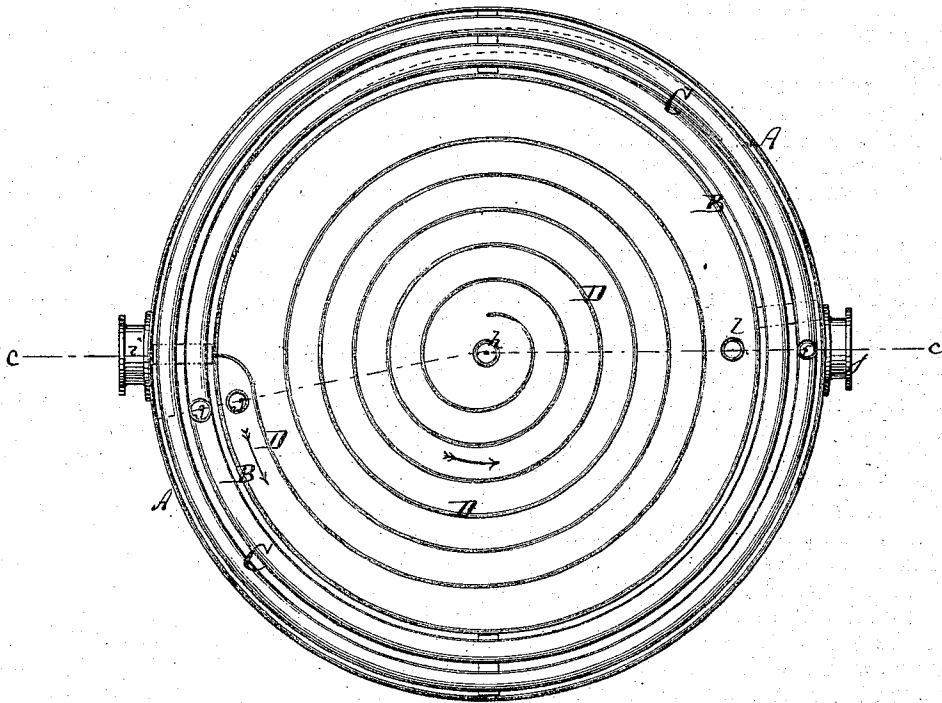


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN GATES, OF PORTLAND, OREGON.

IMPROVEMENT IN FEED-WATER HEATERS.

Specification forming part of Letters Patent No. 128,033, dated June 18, 1872.

To all whom it may concern:

Be it known that I, JOHN GATES, of Portland, in the county of Multnomah and State of Oregon, have invented a new and improved Feed-Water Heater; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 represents a vertical central section of my improved feed-water heater taken on the line *c c*, Fig. 2. Fig. 2 is a horizontal section of the same on the line *k k*, Fig. 1.

Similar letters of reference indicate corresponding parts.

This invention relates to a new feed-water heater and mud-retainer for steam boilers, in which the heat of the exhaust steam is fully utilized and the sediment from the water collected before the water is admitted to the boilers.

My invention will be first fully described and then clearly pointed out in the claims.

A in the drawing represents a cylindrical vessel of suitable size and proper strength. B is a smaller cylindrical vessel, placed concentrically within A, and upon the bottom *a* of the same, but so that a space, *b*, is left between the top *d* of A and the top plate *e* of B, as is clearly shown in Fig. 1. C is a single, double, or treble coil of pipe, placed around the cylinder B within A. At *f* the feed-water enters the coil C. At *g* it leaves the coil, and is conducted into the outer part of the cylinder B. Within the cylinder B is arranged a spiral upright plate, D, extending from top to bottom of the same. This plate D forms a spiral channel, within which the water slowly travels toward the center of the cylinder B, where the outlet-pipe *h* is arranged. This pipe reaches with its open end nearly to the top of the cylinder B, as shown, so as to take the water from above. The exhaust steam enters the cylinder A at *i* and leaves it on the opposite side at *j*. It surrounds thus the cylinder B at the sides and on top, and serves to heat the feed-water. It would be useless to apply the steam to the bottom of B, as the sediment there collected would render it inef-

fective. *l* is a mud-pipe applied to the bottom of A and B near the outer part of the latter, for allowing the sediment or mud to be blown out. For blowing it out the surface blow-pipe of the boiler is connected to the feed-pipe between the heater and the boiler. The cock in the surface blow-pipe and that in the mud-pipe *l* are then opened and the heavy sediment ejected. Try-cocks, to ascertain the height of mud, can be applied to the cylinder B, and projected through the coil C and side of A. I also use a pressure-gauge attached to the feed-pipe in the engine-room, so that the engineer can at all times see whether the pumps are operating, and that the air has not worked or has leaked out of the air-chamber to strain the feed-pipe. A hole is provided in the bottom of the heater for carrying off the condensed water that collects in the coiled space. I lead the waste-pipe into the feed-pump suction-pipe, so that the pump sucks all the condensed water, together with the oil carried off with the exhaust steam when oil is put in the cylinder to oil valves and pistons. In thus saving the condensed water I have what heat it contains, which is a clear gain, there being no mud in condensed water. I expect to have enough coiled pipe to heat the feed-water above the boiling point before it enters the settling part of the heater. There will thus be a large amount of condensed water. The waste oil constantly entering the boiler prevents the formation of scales or incrustation therein, and is thus very useful, while otherwise it would be entirely lost.

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

1. The scroll-shaped water-chamber and mud-arrester B D, having inlet and outlets *g h*, and covered on sides and top by the exhaust steam, as set forth.

2. The exhaust-steam chamber A, the coil C, and the scroll-chamber B D, all combined, constructed with inlets, outlets, and connections, and adapted to be applied to a boiler, as and for the purpose set forth.

JOHN GATES.

Witnesses:

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