J. H. HERRICK.

Steam-Generators.

No. 147,499. Patented Feb. 17, 1874.

Fig. 1.

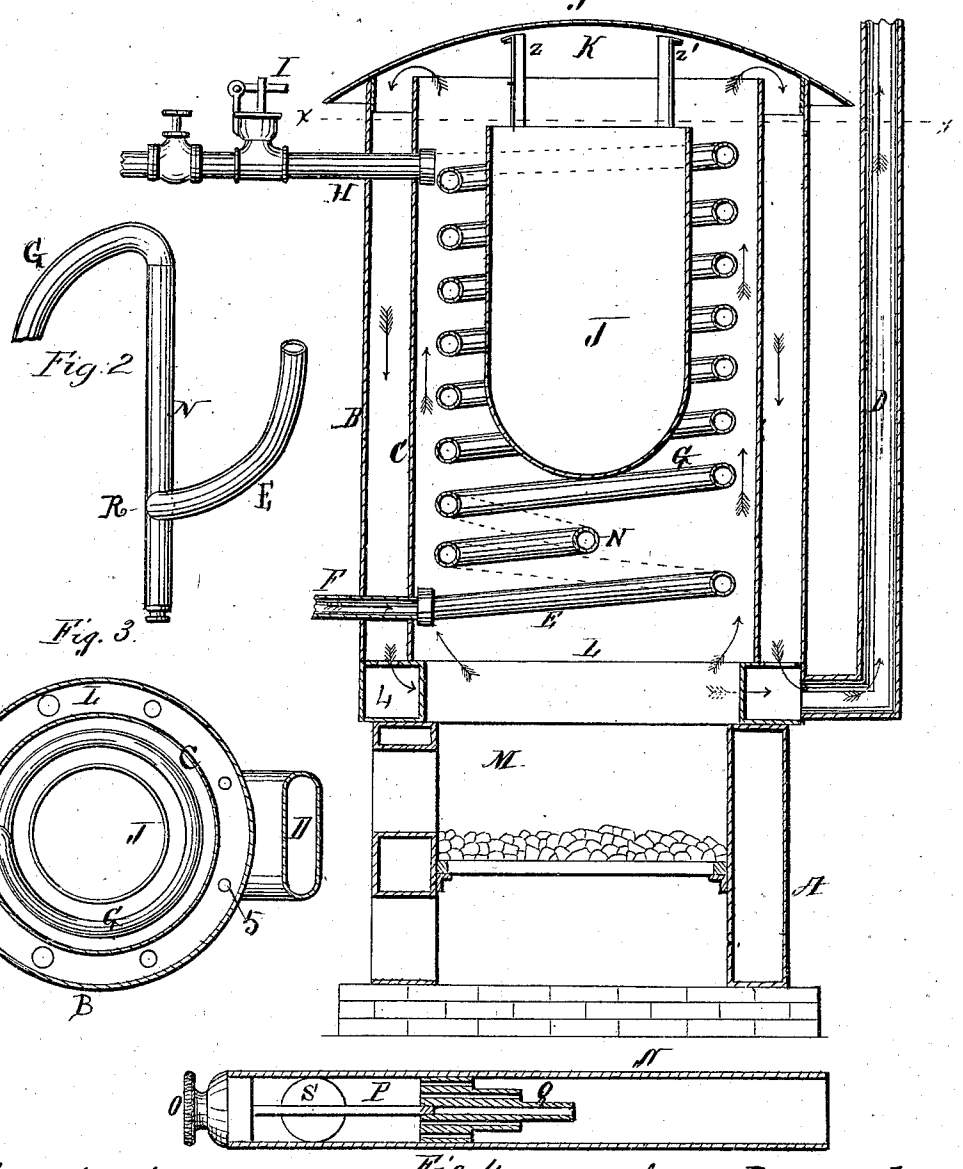

Fig. 2

Fig. 3.

Fig. 4

Witnesses

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J. HENRY HERRICK, OF STONEHAM, MASSACHUSETTS.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. **147,499**, dated February 17, 1874; application filed November 5, 1873.

To all whom it may concern:

Be it known that I, J. HENRY HERRICK, of Stoneham, in the county of Middlesex, in the State of Massachusetts, have invented a certain new and useful Improvement in the Method of Generating Steam; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of my improved steam-generating apparatus. Fig. 2 is a view showing the manner in which the supply-pipe and receiving-pipe are connected with the cross-pipe or spray-generator. Fig. 3 is a plan or transverse sectional view taken at the line *x y*, Fig. 1. Fig. 4 is a longitudinal sectional view of the spray-generating mechanism.

Like letters refer to like parts in the different figures of the drawings.

The object of my invention is to produce steam with the greatest rapidity and a minimum consumption of fuel, and also to do away to a large extent with the cumbersome and expensive boilers necessary in the ordinary apparatus.

In Fig. 1, A is a fire-pot or furnace of the usual construction having the ordinary lining, grate, and doors. Through or across this furnace, at a short distance above the fuel-line, I pass or insert horizontally the tube N. This tube is closed at the outer end by the plug O, Fig. 4, and has within it a rod, P, connected with said plug, and carrying a perforated piston-head or spray-generator, Q. The plug O is constructed to fit water-tight in the end of the tube when the spray-generator is in use or operation. Connected with the tube N, at R, Fig. 2, is a closed receptacle or pipe, G, which, in my invention, takes the place of the boiler in the ordinary apparatus. This pipe is coiled within the furnace above the pipe E in such a manner as to be subjected to the greatest amount of heat, and passing out of the furnace at H is provided with an ordinary weighted safety-valve, I, as shown. E is a water-supply or induction pipe passing into the furnace at F, and after making about one and one-fourth turns connects with the generator N, at S, Fig. 4, or between the plug O and spray-former or perforated piston-head Q. The walls of the furnace A are arranged as shown in Fig. 1, the cap or crown of the furnace being attached to the outer wall B, the inner wall C being somewhat shorter than the outer, thus creating a flue, through which the smoke and products of combustion from the fuel-chamber pass, as indicated by the arrow into the funnel or chimney D. Suspended from the crown K by stays or supports *z z'* is a cone or deflector, J, arranged within the coils of the pipe G, the object of which is to throw the heat from the center of the furnace upon the pipe or receptacle G in its upward passage. At the top of the fuel-chamber M, and at the base of the walls B C, is a chamber, L, extending around the furnace, the object of which is to produce an even draft to the apparatus. For this purpose said chamber is constructed with a series of apertures through its upper surface, of uneven or varying size, the smallest of the apertures being nearest the funnel D, where the draft is greatest, and the largest at the opposite side of the furnace, where the draft is weakest, (see 4 5, Fig. 3,) thus equalizing the draft by providing a greater or less area of opening corresponding with the distance from the funnel D.

From the above the operation of my improved steam-generator will be readily understood by those conversant with such matters, and is substantially as follows: A fire being started in the fuel-chamber M, water is forced, by any ordinary means, through the induction-pipe F, into the pipe E, where it is very rapidly heated to a high degree of temperature, and passes into the tube N, thence through the generator or spray-former Q, by which it is converted into fine spray and injected into the pipe or receptacle G, where it is instantly flashed or converted into steam, which, by passing through the numerous coils of said receptacle on its way to the engine or out of the furnace, becomes superheated. The perforations in the piston-head Q are so constructed and arranged with reference to each other that

the heated water, as it is forced through them in small streams, is more effectually converted into spray by the streams being caused to impinge or strike each other at the point of egress. I prefer to have the streams impinge at an angle of from forty-five to ninety degrees, the latter producing very fine spray.

It will be seen that the arrangement of the tube N admits of the easy removal of the plug O, rod P, and piston-head Q, for purposes of repairing or cleaning, said tube passing through the walls B C from the outside of the furnace. It will also be readily understood by those familiar with such subjects that a stream of cold water forced through the generator or piston-head Q, although broken into spray, would condense the steam as fast as formed. For this reason the pipe E should always be of sufficient capacity to heat the water before it passes into the tube N.

I am aware that Letters Patent of the United States were granted to one F. Bowman, November 27, 1866, for a drying device denominated a "stove-cricket," but the apparatus described in said patent is for a different purpose and different in its construction and arrangement from mine. I therefore claim nothing whatsoever shown or described in said last-named patent wherein and of itself considered.

What I claim as of my invention is—

1. In an apparatus for generating steam, the combination of the furnace A, pipe E, closed receptacle G, tube N, and spray-forming mechanism described, substantially as and for the purpose specified.

2. The deflector J, in combination with the pipes G and E and tube N, substantially in the manner described, the whole being arranged within the furnace A, for the purposes specified.

3. The chamber L, provided with a series of unequal apertures, 4 5, in combination with the pipe G, deflector J, funnel D, and furnace A, substantially in the manner and for the purpose set forth.

4. The tube N, plug O, rod P, and spray-former Q, combined substantially in the manner described.

J. HENRY HERRICK.

Witnesses:

C. A. SHAW,

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