

W. C. BAKER.
Steam-Generators.

No. 144,047

Patented Oct. 28, 1873.

Fig. 1.

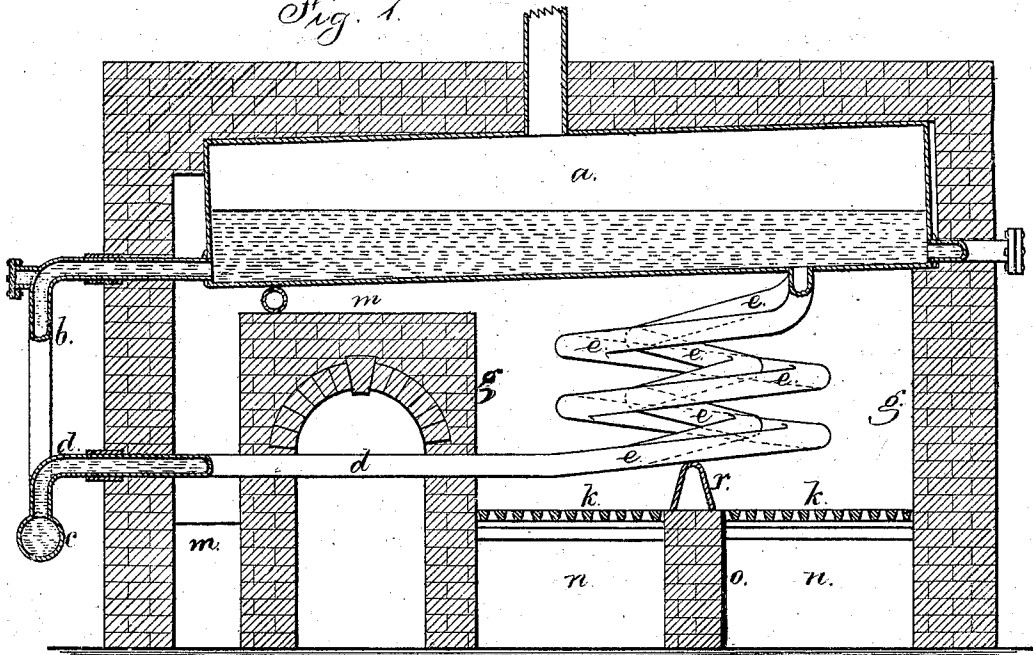
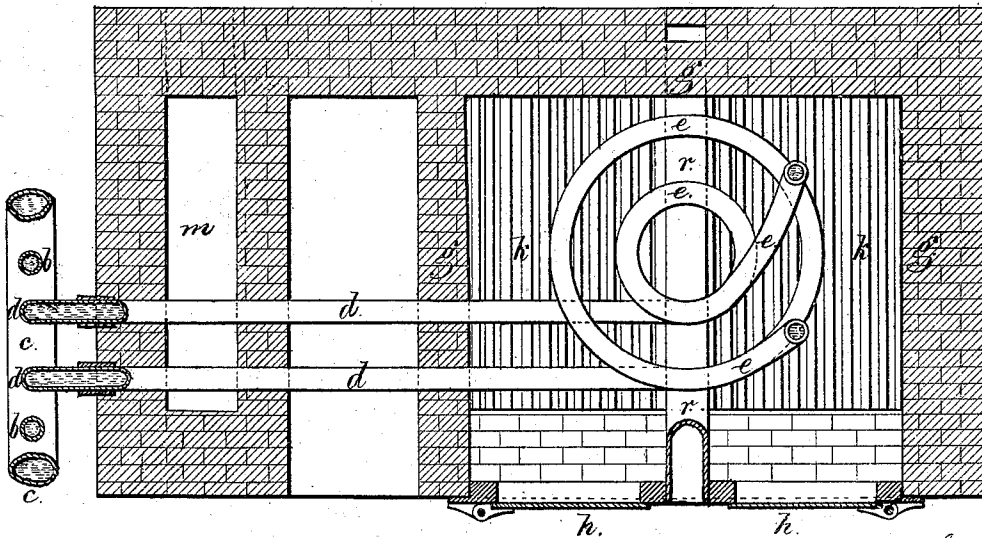


Fig. 2.



Witnesses.

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att'y.

UNITED STATES PATENT OFFICE.

WILLIAM C. BAKER, OF NEW YORK, N. Y.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. **144,047**, dated October 28, 1873; application filed July 3, 1873.

To all whom it may concern:

Be it known that I, WILLIAM C. BAKER, of the city and State of New York, have invented an Improvement in Steam-Generators, of which the following is a specification:

Steam-generators have heretofore been made with special reference to producing steam for heating purposes; and in apparatus of this character the water has circulated through coils of pipe in the fire-chamber, as may be seen in Letters Patent granted to me, No. 40,722 and 60,459.

My present invention is an improvement upon the aforesaid steam-generators, and is made with reference to promoting greater rapidity of circulation, increasing the heating-surface, promoting combustion, and allowing the steam to separate more easily from the circulating water.

In the drawing, Figure 1 is a section longitudinally of the apparatus; and Fig. 2 is a plan, partially in section.

The steam-drums *a* are set at a slight inclination, and from the lower ends the descending tubes *b* connect with the transverse circulation and return or feed-water pipe *c*; and from this pipe *c* the pipes *d* rise and extend to the coil or coils *e*, that are within the fire-chamber, and connect at their upper ends with the lower portions of the drums *a*. The fire-chamber is inclosed by the walls *g*, and provided with doors *h* and grate-bars *k*, and the products of combustion pass away beneath the drums *a* by the flue *m*.

The ash-pit *n* may be divided into two parts by the wall *o*, and there are separate doors, so that the atmosphere may be admitted into either or both ash-pits.

There is a bar, *r*, that also separates the fire-chambers; it is above the wall, and upon it the coils *e* rest; and this bar *r* is hollow, and opens at one end through the wall of the furnace, and at the other end said bar opens either into the furnace or into a flue in the brick-work, so that the external atmosphere is drawn through the same to lessen its temperature and diminish the risk of burning out.

There may be a fire in either or both sides of the fire-chamber, as the fuel is separated by the bar *r*, and the atmosphere can be admitted to either or both of the ash-pits.

It will now be understood that the water

circulates upwardly through the coil or coils in the fire-chamber and enters the water and steam drum *a*, where there is ample space for the steam to separate and pass off, and the water circulates downwardly to the lowest and coolest end of the drum; then, by the pipes *b c* and pipe *d*, back to the coil. This circulation is maintained continuously while the fire is kept up, and the cold water or return-water of condensation is introduced into the pipe *c*, where the water is coolest.

By constructing each coil of heating-pipe as a continuous spiral within the fire-chamber the heat acts to great advantage, because the spiral is sufficiently open to allow the fuel to pass between the coils of pipe and to settle down as it is consumed, and the draft through the fire is not obstructed by the coils. The fire-space between the pipes in the coil is large in proportion to the size of pipe—that is to say, the distance between one pipe and the next must be about twice the diameter of the pipe—so that the pipes containing the circulating water will not cool the air-chamber and prevent a perfect combustion of the fuel. By maintaining these proportions the greatest possible benefit will be obtained from the fuel, because perfection in the combustion prevents waste of fuel, and the greatest rapidity of circulation possible is obtained by the action of the heat, thereby securing great economy of fuel and rapidity of action in the boiler.

I claim as my invention—

1. The arrangement of the water and steam drums, circulating-pipes *b*, feed-water and circulating pipe *c*, pipe *d*, and coil *e* within the fire-chamber, and connecting with the drum *a*, substantially as and for the purposes set forth.

2. The hollow bar *r*, through which the atmosphere passes, and which separates the fire-space and rests upon the division-wall *o* of the ash-pit *n*, in combination with the circulating-coil *e*, that rests upon said bar *r*, and is connected with the water and steam drum, substantially as and for the purposes set forth.

Signed by me this 27th day of June, A. D. 1873.

W. C. BAKER.

Witnesses:

GEO. D. WALKER,
GEO. T. PINCKNEY.