

D. RENSHAW.
Steam-Generators.

No. 149,061.

Patented March 31, 1874.

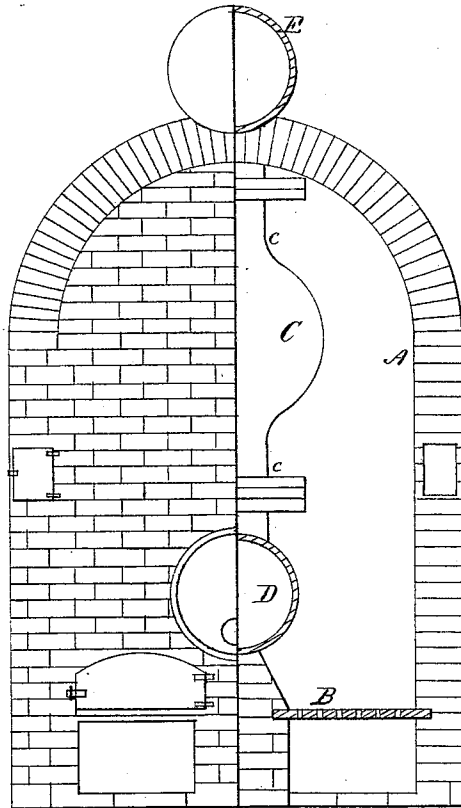


Fig 1

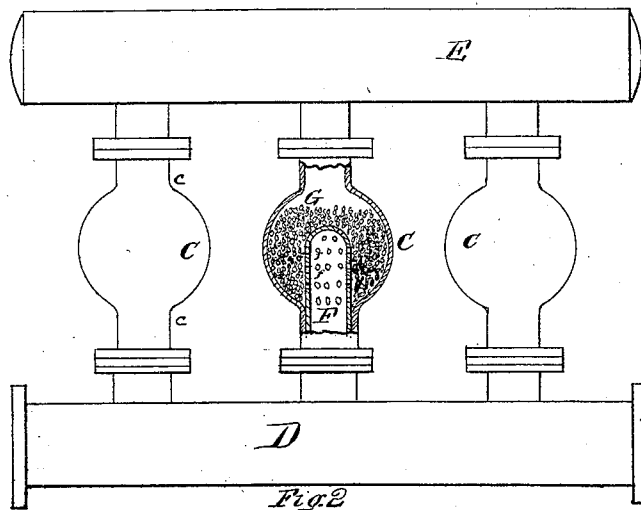


Fig 2

Witnesses

M. Connolly
J. B. Connolly

Inventor

David Renshaw
by Connolly, Bros
his attys

UNITED STATES PATENT OFFICE.

DAVID RENSHAW, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO LYDIE F. RENSHAW, OF HINGHAM, MASSACHUSETTS.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. **149,061**, dated March 31, 1874; application filed May 20, 1873.

To all whom it may concern:

Be it known that I, DAVID RENSHAW, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Generators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

In the drawings, Figure 1 is a front-end view and partial section of an apparatus embodying my invention. Fig. 2 is a side view and partial section of steam-generator.

My invention has for its object to provide means whereby steam can be generated more rapidly and with greater economy than heretofore.

The nature of my invention consists of a generator composed of such materials and so constructed that steam may be generated instantaneously by the application of water in jets to heated surfaces.

Referring to the accompanying drawing, which illustrates my invention, A represents a reverberatory furnace, of the usual or suitable construction, having a grate, B. C represents a globe of cast metal, having open flanged projections or pipes *c c*, by which communication is had with the horizontal supply-pipe D and steam-drum E. F represents the induction-pipe, located within the globe, and its lower projection, as shown, closed at its upper end or termination, but having minute perforations *f f*, whose aggregate capacity is equal to the water-delivery desired. G represents a filling of bone charcoal in the globe C, being placed loosely therein.

The operation is as follows: Water being held in the horizontal and induction pipes, a fire is started in the furnace, and when sufficient heat has been attained, and steam begins to be generated from the induction and horizontal pipes, the feed-pump is started, forcing water through the horizontal pipe, where its temperature is raised to a considerable extent, thence through the induction-pipe F, from which it is discharged in minute jets, which

are instantaneously converted into steam and rise to the drum E.

I have named bone charcoal as the filling for the globe, because this is the best material for the purpose with which I am acquainted; being a good conductor, it receives heat rapidly, and gives it immediate action on the jets of water being dispersed through it from the pipe F.

A further advantage of this material is that it may be raised to a very high temperature, and water brought in direct contact with it without danger.

The valuable qualities of bone charcoal in this connection are, first, that it is an excellent conductor of heat; and, secondly, that it absorbs moisture very rapidly. Metal would not answer the same purpose, because—although it is a good conductor of heat, though not the best—it does not absorb moisture at all. Hence any material to be substituted for bone charcoal must possess its qualities, as above described; otherwise it would not be an equivalent.

So, too, as the bulk of impurities in water (particularly in creeks and rivers) is composed of vegetable matter, it will be taken up by the bone charcoal, and may be passed off in the form of gas by applying the requisite heat to the boiler, the water being drawn off, and the safety-valve being opened for the escape of such gas. This characteristic is not possessed by iron, nor by wood charcoal, which latter, in addition, would speedily become valueless by being reduced to fine powder.

A filling being placed inside the globe, and a high heat communicated to it, it is manifestly impossible that the water, as water, can reach the globe; on the contrary, the jets must be converted into steam before reaching the globe, whereby all danger that might otherwise result from the direct contact of water and metal at a high temperature is avoided. By graduating the water delivered to the globe, by using a less or greater number of jets, the temperature of steam generated will be increased or lessened accordingly.

I have illustrated the furnace as containing a single horizontal pipe and three globes; but I design using any less or greater number that

I please—as, for instance, a single globe or series of horizontal pipes with any requisite number of induction-pipes and globes.

If desirable, where two or more horizontal pipes are employed, they may communicate by a riser or open projection, and the feed be supplied through one alone.

It will be obvious that other forms of horizontal pipes besides the straight ones shown may be employed, as a circular pipe in a round furnace, and the globes and induction-pipes combined therewith in the manner shown for straight pipes. In case of a straight horizontal pipe, I feed at one end and blow off at the other end, and in the case of a circular pipe at any suitable point where risers or open projections can be advantageously employed.

What I claim as my invention is—

1. In combination with a generator or globe, C, and an induction-pipe, F, a filling of bone charcoal, G, as and for the purpose described.

2. The combination, with a generator or globe, C, an induction-pipe, F, and a filling of bone charcoal, G, of a reverberatory furnace, A, and horizontal pipe D, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of May, 1873.

DAVID RENSHAW.

Witnesses:

M. DANL. CONNOLLY,
GEO. C. SHELMERDINE.