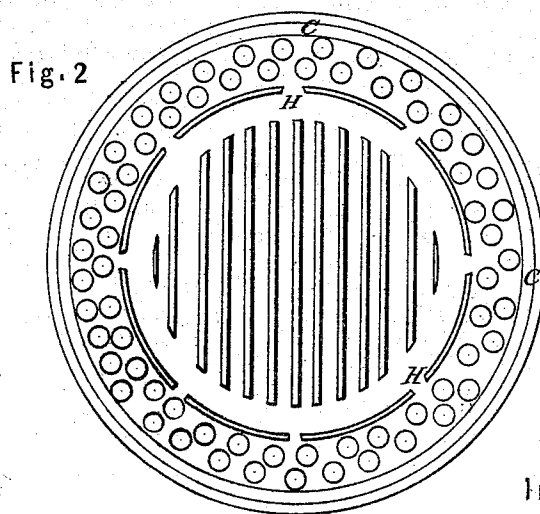
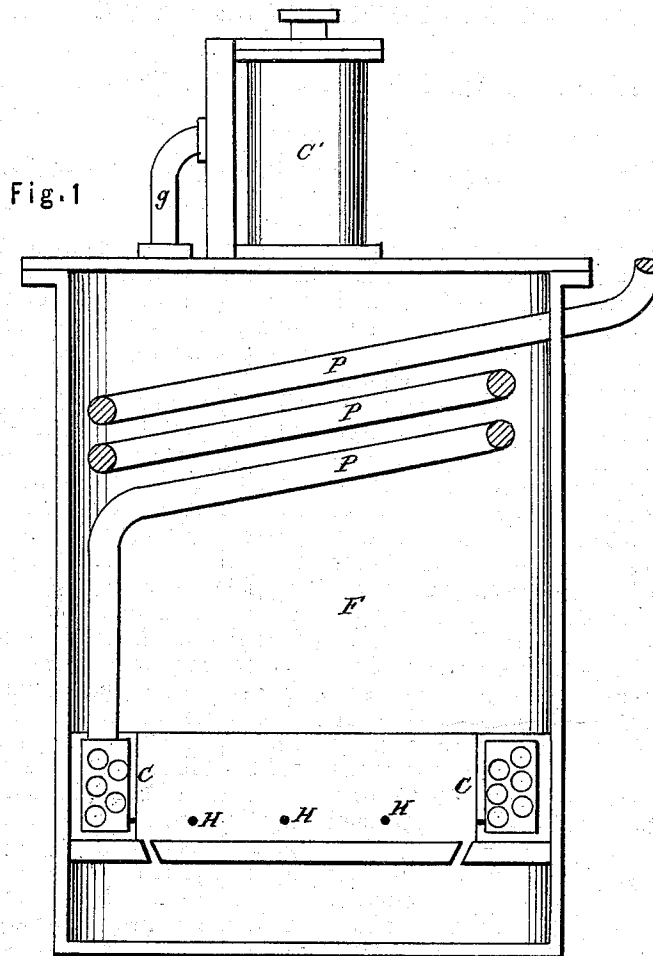


THOMAS McDONOUGH.
Improvement in Generators of Combined Steam and
Products of Combustion.

No. 125,140.

Patented April 2, 1872.



Witnesses.

Geo E Beebe
Geo Follett

Inventor.

Thomas McDonough

UNITED STATES PATENT OFFICE.

THOMAS McDONOUGH, OF NEW YORK, N. Y.

IMPROVEMENT IN GENERATING AND UTILIZING STEAM AND THE PRODUCTS OF COMBUSTION.

Specification forming part of Letters Patent No. 125,140, dated April 2, 1872.

I, THOMAS McDONOUGH, of the State and county of New York, have invented an Improved Method of Decomposing Water and using the same for a Motive Power, of which the following is a specification.

The purpose of my invention is to raise water gradually to steam of such a temperature that it may be thrown upon heated fuel in large volumes, to combine with it without either cooling the fuel or destroying the metals of the apparatus by heating them so much as to oxidize them. My invention consists of a combination of pipes with a chest containing small pieces of metal, all placed in a furnace, and so arranged that by means of this arrangement water may be very gradually raised to the temperature necessary for the dissociation of its component gases without exposing the metal to oxidation, and at the same time allowing sufficient steam to pass through the furnace without decomposition to enable me to use the gases in a cylinder with a piston without dryness or any heat that will injure its polished surface.

In the accompanying drawing making part of this specification, Figure 1 is a section of the furnace in elevation. Fig. 2 is a horizontal section of the same through the metal chest.

The following is the method of constructing the apparatus: I place a coil of pipe, P, inside the furnace F, and near its top, protected by fire-clay. The upper end of the pipe passes out of the furnace, and the lower end enters the top of the chest C. This chest is a hollow casting surrounding the fire, with an opening at the top for the pipe P, and a number of small holes, H H, near the bottom and on the inside. This chest is filled with metal balls, and is protected from contact with the fuel by a lining of fire-clay, which is pierced with holes to meet the holes H H in the chest C. The cylinder C' is placed outside the furnace, but

either upon it or so in contact with it as to be moderately heated; and the gases are taken from any point in the top or side of the furnace by a pipe, g, which connects with the cylinder in the same way as in other heat-engines.

When the engine is to be used at a pressure above the atmosphere the water must be forced into the pipe P by a small pump, and a small quantity of air—about one-tenth of what is usually allowed to support combustion—must also be forced into the furnace. When the gases are designed to be cooled after leaving the cylinder, (using the engine as a condensing steam-engine,) the furnace is supplied with a very small quantity of air by the natural draught, and I also drop water into the upper end of the pipe P at the rate of three hundred drops of water per minute for every square foot of grate surface. The water is gradually heated, and becomes steam before reaching the balls in the chest. It issues from the small holes heated to a high temperature, and, passing through the holes in the clay lining of the chest, is partly decomposed without injury to the metals on its passage. I use cast-iron balls of one-half inch diameter in the chest, which remain unchanged. As part of the steam passes through the fire without decomposition, the mixture of gases and steam is then utilized in the cylinder, either by direct pressure, or indirectly by condensing them after their passage through it.

I claim as my invention—

1. The chest filled with balls, substantially as described.
2. The combination of the pipe with the chest filled with metallic pieces, substantially as described.

THOMAS McDONOUGH.

Witnesses:

GEO. E. BEEBE,
GEO. FOLLETT.