

(No Model.)

H. C. CHRISTOPHER.
GENERATOR.

No. 594,858.

Patented Dec. 7, 1897.

FIG. 1.

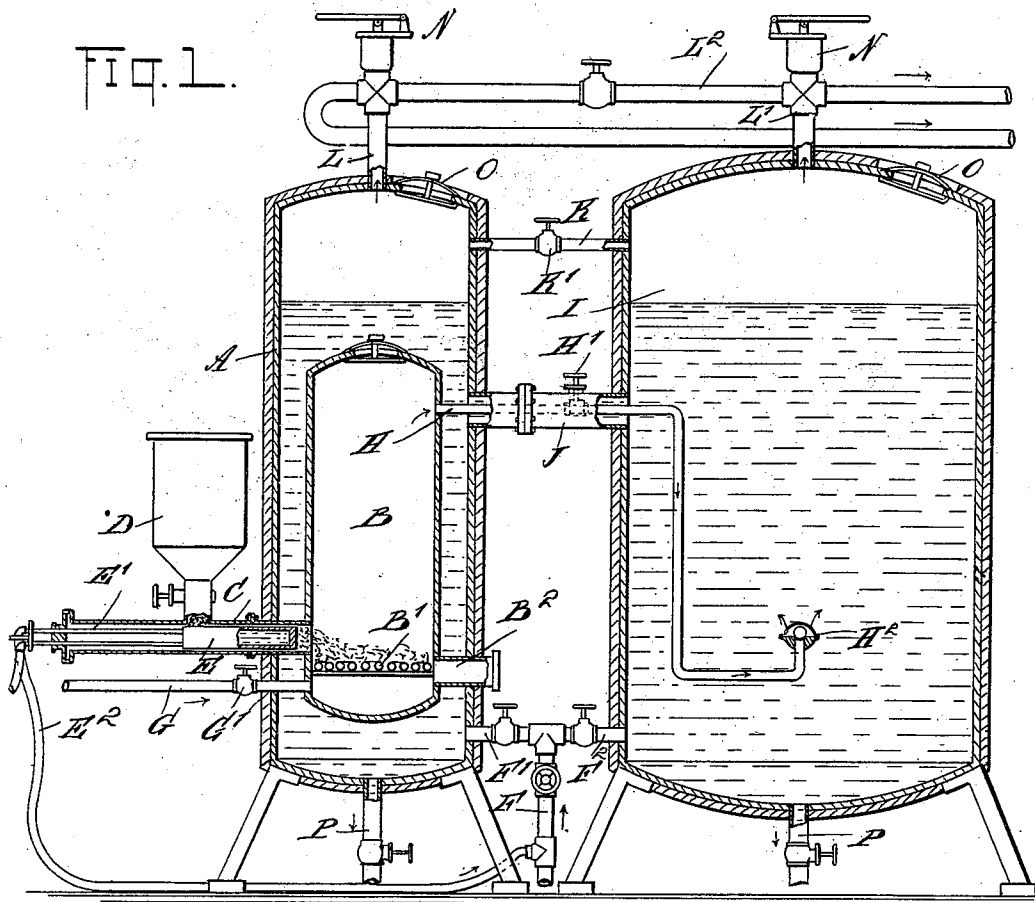
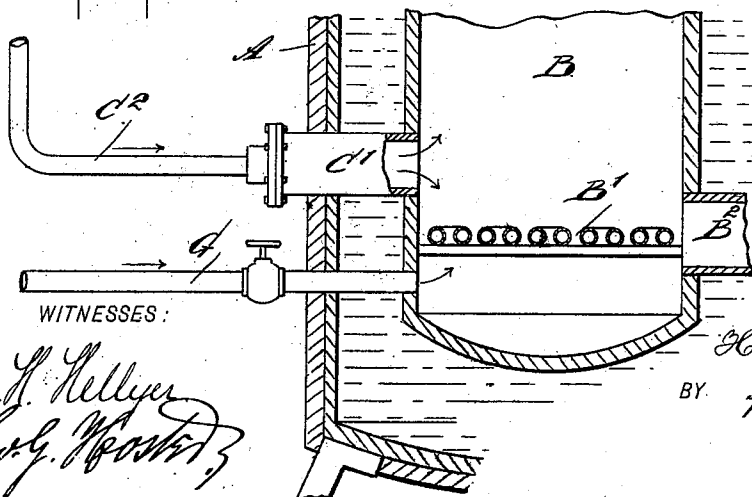


FIG. 2.



WITNESSES:

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HENRY CREAK CHRISTOPHER, OF MERIDIAN, MISSISSIPPI, ASSIGNOR TO HIMSELF, CHARLES C. KING, AND MATHEW T. MURPHREE, OF SAME PLACE.

GENERATOR.

SPECIFICATION forming part of Letters Patent No. 594,858, dated December 7, 1897.

Application filed February 27, 1897. Serial No. 625,300. (No model.)

To all whom it may concern:

Be it known that I, HENRY CREAK CHRISTOPHER, of Meridian, in the county of Lauderdale and State of Mississippi, have invented a new and Improved Generator, of which the following is a full, clear, and exact description.

It is the object of my invention to provide an improvement in the class of steam-generators in which the gaseous products of combustion are conducted from the furnace proper into the water-space in order to more fully utilize the heat and economize fuel.

The invention is hereinafter set forth. Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both figures.

Figure 1 is a sectional side elevation of the improvement as arranged for burning solid fuel, and Fig. 2 is an enlarged sectional side elevation of the steam-boiler and combustion-chamber arranged for burning gaseous fuel.

The improved generator, as illustrated in Fig. 1, is provided with a steam-boiler A, containing a combustion-chamber B, completely surrounded by the water contained in the boiler A and provided near its bottom with a grate B', fitted to receive the fuel from a fuel-supply pipe C, extending through the boiler A to the outside to be connected at the outer end with a hopper D, filled with the fuel to be used. A plunger E is arranged to slide in the pipe C, so as to push the fuel delivered by the hopper D into the pipe C forward in the latter into the combustion-chamber B, so that the fuel passes onto the grate B'. The plunger E is preferably made hollow, and its plunger-rods E' are preferably in the form of tubes connected at their outer ends by a hose E² with a water-supply pipe F. Into the lower end of the combustion-chamber B opens an air-supply pipe G, provided with a valve G' and connected with a compressed-air reservoir, air-compressor, or the like for forcing compressed air into the lower end of the combustion-chamber B to supply the burning fuel on the grate B' with the necessary air to insure complete combustion. An outlet-pipe B² is arranged in the lower end of the combustion-chamber B and

extends to the outside of the boiler A and is normally closed at the outer end by a suitable cap. This outlet serves to remove ashes and the like from the combustion-chamber whenever necessary. The upper end of the combustion-chamber B is connected by a pipe H with a second boiler I, and the said pipe H passes through a connection J between the two boilers A and I. The pipe H is provided at the connection J with a valve H', and the end of the pipe within the boiler I is provided with a suitable valve-nozzle H², submerged in the water contained in the boiler I. The latter, as well as the boiler A, is connected near its bottom by valved branch pipes F² F' with the valved supply-pipe F, connected with a suitable water-supply.

By the arrangement described the necessary amount of water is supplied to both boilers A and I, so as to keep the water therein at an approximately constant level. The upper ends or steam-compartments of the boilers A and I are connected with each other by a steam-pipe K, having a valve K', and from the top of the said boilers extend steam-outlet pipes L and L', connected with a valved pipe L², for leading the steam to the machinery to be driven. Each of the pipes L and L' is provided with a safety-valve N of any approved construction. The top of each boiler A and I is further provided with a man-hole O, and a blow-off pipe P leads from the bottom of each boiler to clean the same of sediment whenever necessary.

If it is desired to burn gaseous fuel in the combustion-chamber B, a pipe C' is connected with the boiler A and chamber B and by a pipe C² with a suitable gas-supply, and the hopper D and plunger E are dispensed with; but otherwise the arrangement is the same as the one above described in reference to Fig. 1.

The operation is as follows: The fuel is burned in the combustion-chamber B with the aid of compressed air supplied by the pipe G, and the gaseous products of combustion pass from the chamber B through the pipe H and nozzle H' into the water contained in the boiler I, so that the said gases are purified on rising through the water and at the same time heat the latter sufficiently to generate steam.

The heat emanating from the combustion-chamber B heats the water contained in the boiler A, so that steam is also generated from the latter, and if the valve K' is open the
5 same pressure of steam is maintained in both boilers A and I. Steam can be drawn off from either or both boilers by the pipes L L' and the pipe L².

Now it will be seen that by the arrangement
10 described no loss of heat to any appreciable extent takes place, and consequently the fuel burned has its units of heat utilized to the fullest advantage, it being understood that the gaseous products of combustion mix with
15 the steam in the boiler I and are used with the steam for driving the machinery.

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

20 The improved steam-generator, comprising

the two boilers arranged side by side and having horizontal steam and water pipe connections, the combustion-chamber arranged within one of said boilers, and free from contact with the same so that it is entirely sur- 25 rounded by a water-space, the pipe leading from said combustion-chamber through the water-pipe which is of much greater diameter, and into the adjoining boiler where it is provided with a nozzle as shown, the fuel- 30 hopper arranged alongside a boiler and having a tubular feed attachment that projects through the latter and connects with the inclosed combustion-chamber, as shown and described.

HENRY CREAK CHRISTOPHER.

Witnesses:

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