

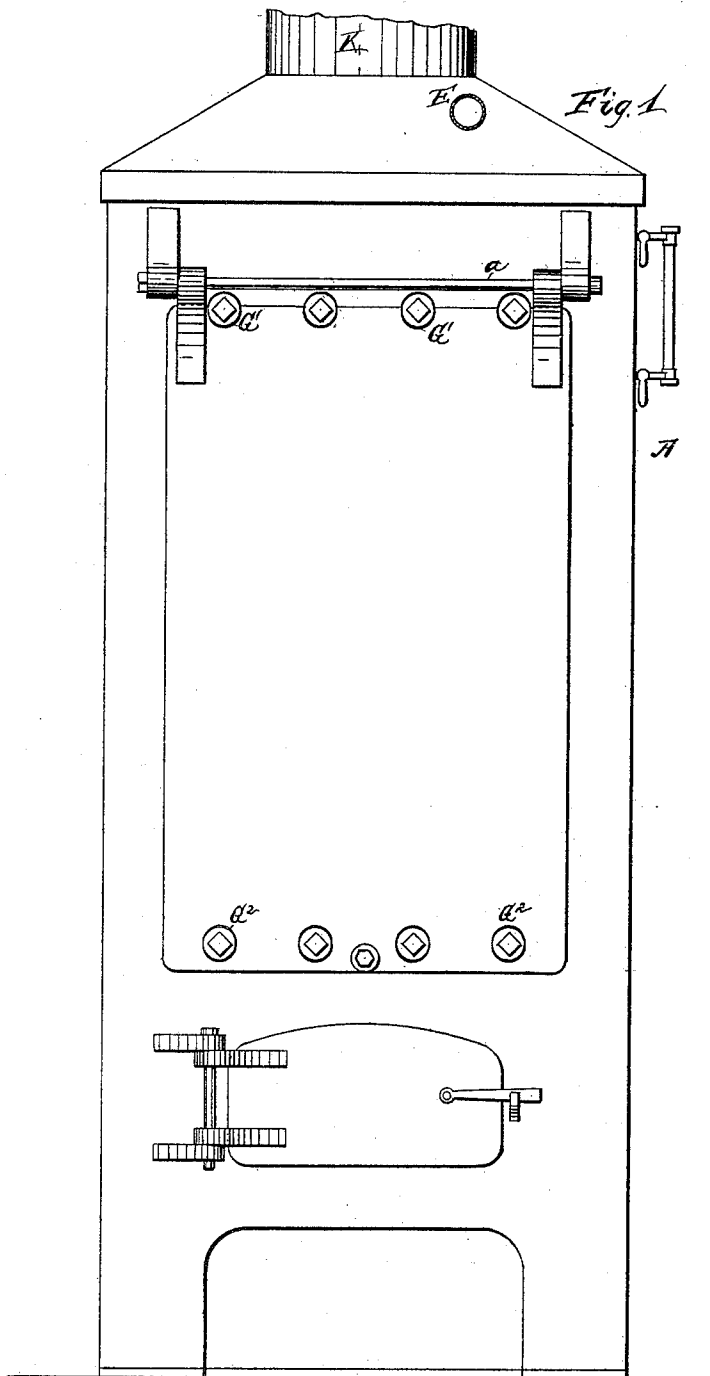
(No Model.)

3 Sheets—Sheet 1.

J. LORILLARD.
STEAM BOILER OR GENERATOR.

No. 462,868.

Patented Nov. 10, 1891.



Witnesses
C. R. Tugman
Wm. M. Cluff

By his Attorney

Inventor
Jacob Lorillard
Edwin H. Brown

(No Model.)

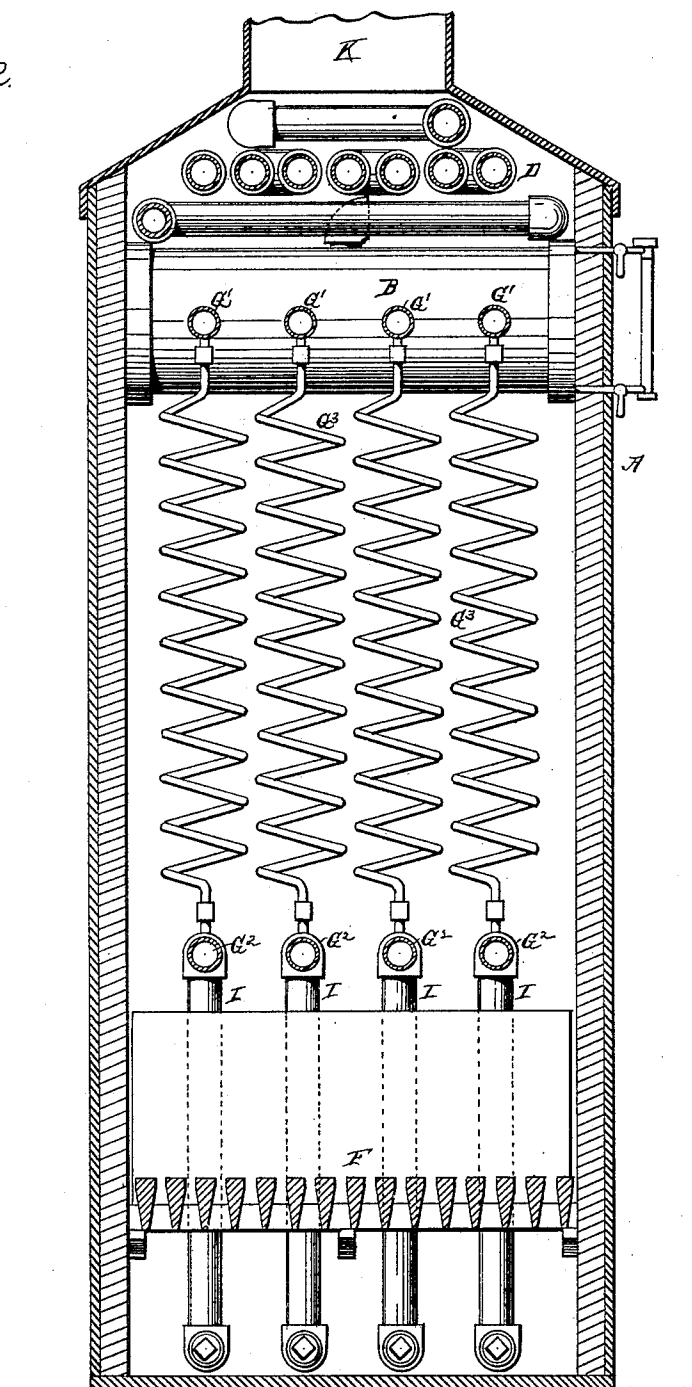
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Fig. 2.



Witnesses
Chas. Ferguson
William W. Duff

Inventor
Jacob Lorillard
By his Attorney *Edwin H. Brown*

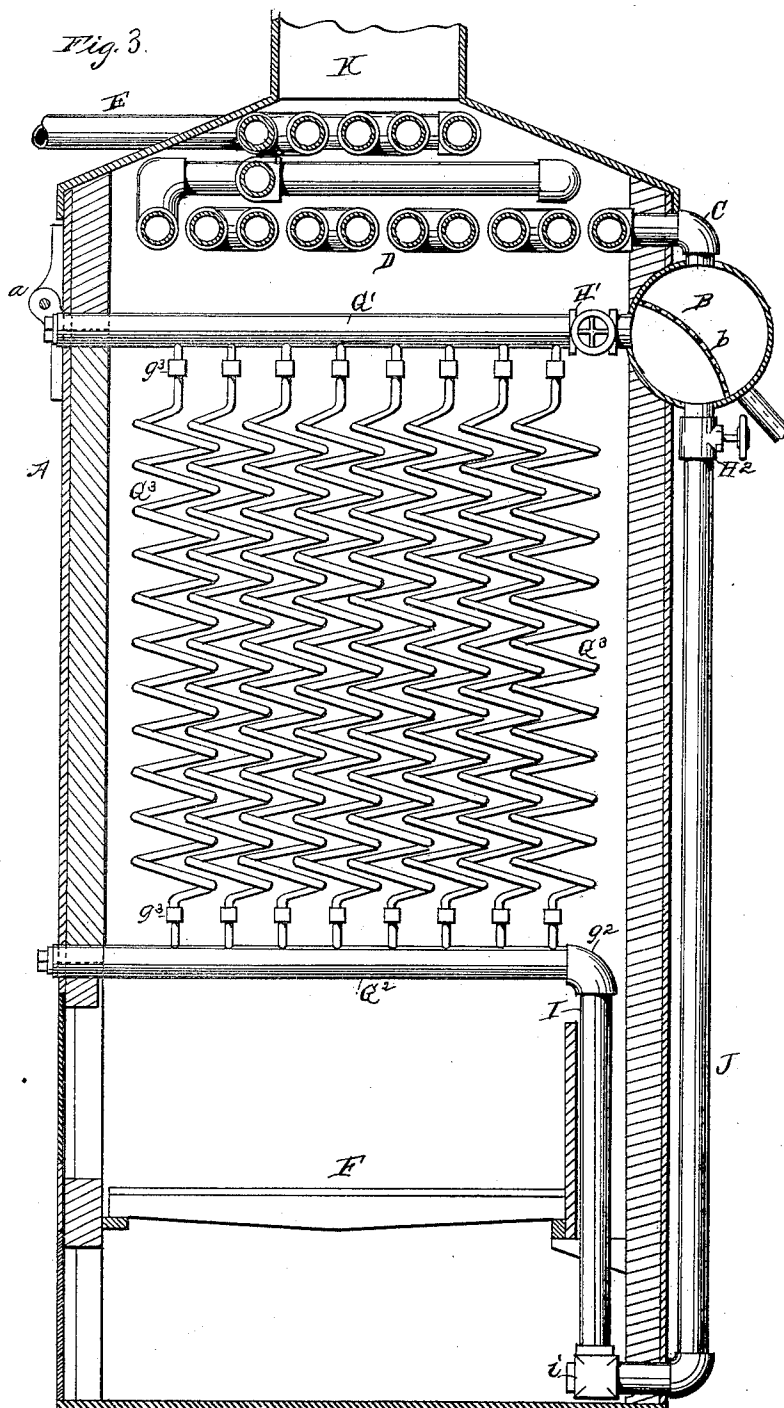
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UNITED STATES PATENT OFFICE.

JACOB LORILLARD, OF NEW YORK, N. Y.

STEAM BOILER OR GENERATOR.

SPECIFICATION forming part of Letters Patent No. 462,868, dated November 10, 1891.

Application filed January 16, 1891. Serial No. 377,962. (No model.)

To all whom it may concern:

Be it known that I, JACOB LORILLARD, of New York, in the county and State of New York, have invented a new and useful Improvement in Steam Boilers or Generators, of which the following is a specification.

My improvement consists in the combination of a separator wherein steam may separate from water and a number of sinuous pipes arranged in several sets, those of each set being connected with the separator independently from those of all the other sets. The sinuous pipes of each set are connected with main pipes which extend between them and the separator, and these main pipes are provided with valves whereby communication with the separator can be established or cut off at any time. These main pipes are detachably connected to the parts with which they immediately communicate, and, owing to this, any set of the sinuous pipes with their main pipes can be cut off at any time and removed at pleasure for repairs. The sinuous pipes are detachably connected with the main pipes. The capacity of the main pipes of each section will be greater than the aggregate capacity of the sinuous pipes communicating therewith, so as to avoid any possible interference with a rapid circulation through the sinuous pipes.

In the accompanying drawings, Figure 1 is a front view of a boiler embodying my improvement. Fig. 2 is a transverse vertical section taken parallel with the front. Fig. 3 is a longitudinal vertical section.

Similar letters of reference designate corresponding parts in all the figures.

A designates a case or shell, which may be of any suitable construction.

B designates a separator, here shown as consisting of a drum supported by the upper portion of the shell and arranged only partly within the same. As here shown, it is provided with an oblique curved perforated diaphragm. It is intended that the lower portion of this drum shall contain water and the upper part steam, separated from the water. The steam will pass off through a pipe C to a superheater D, and may be conveyed to the place where needed through a pipe E.

G' G² designate main pipes, and G³ designates

a number of sinuous pipes extending between the same. The capacity of the pipes G' G² is greater than the aggregate capacity of the sinuous pipes communicating therewith. Hence they will not interfere with a rapid and vigorous circulation of water through the sinuous pipes. These pipes G' G² G³ are connected to form independent sections, there being a pipe G', a pipe G², and a number of intermediate pipes G³ in each of the sections. The pipes G³ are preferably made in the form of helical coils, and at the ends will be detachably connected by couplings g³ to nipples formed integral with the main pipes G' G². Between each pipe G' and the separator a valve H' is arranged, and between each pipe G² and the separator a valve H² is arranged. These valves H' H² will be open when the sections to which they belong are in use; but if it is desired to cut off any particular section it may be done by closing the valves H' H² thereof. Not only can each section be thus cut off from communication with the separator B, but it may also be removed because the main pipes G' G² are detachably connected to those parts with which they immediately communicate. The pipes G' are detachably connected with the valves H'. If desired, right and left couplings might be introduced intermediate of the valves H' and pipes G', and then the pipes could be detached from the valves while the latter are still left to fulfill their functions of closing the separator. The pipes G² are detachably connected with couplings g², so as to be removable. The couplings g² are connected with pipes I, which in turn are connected with pipes J. The valves H² are connected with the pipes J. The removal of any pipe G² from its coupling g² would not open the separator B, because the corresponding valve H² would close the separator. Preferably between each pair of pipes I and J there will be a coupling i, constructed to provide for cleaning out mud or sediment.

The pipes G' G² are shown as fitted to recesses in the edges of an opening of a doorway formed in the front of the shell A. This opening is provided with a door A', which is notched at the top to fit the pipes G', and has openings in the lower portion to accommo-

date the ends of the pipes G^2 . This door is connected at the top by a hinge a to the shell A and fastened by a bolt a' at the lower edge. Beneath the pipes G^2 is a furnace F, and at
5 the top of the shell A is a flue K.

The products of combustion from the furnace will circulate through the sections of pipes G' G^2 G^3 , and after passing through the coils of the superheater will escape through
10 the flue K.

I have shown the valves H' H^2 as made in the form of hand-valves or stop-cocks; but advantages might be obtained by making the valves H' in the form of check-valves. As
15 check-valves are well known equivalents for hand-valves, it is not deemed necessary to illustrate herein.

What I claim as my invention, and desire to secure by Letters Patent, is—

20 1. In a steam boiler or generator, the combination, with a shell, of a separator consisting of a drum supported by the upper portion of the shell, a perforated diaphragm in said drum dividing the drum into two portions, a number of sets of vertically-arranged
25

sinuous pipes, main pipes for each set of sinuous pipes, each main pipe connecting with said separator, and detachable connections between said main pipes and the separator, substantially as specified.

30 2. In a steam boiler or generator, the combination, with a shell, of a separator consisting of a drum supported by the upper portion of the shell, a perforated diaphragm within the drum and dividing it into upper
35 and lower portions, a number of sets of vertically-arranged sinuous pipes, main pipes for each set of sinuous pipes, each main pipe connecting with said separator, detachable
40 connections between said main pipes and separator, and valves intermediate of said main pipes and separator, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of
45 two subscribing witnesses.

JACOB LORILLARD.

Witnesses:

S. O. EDMONDS,
JAS. C. CHAPIN.