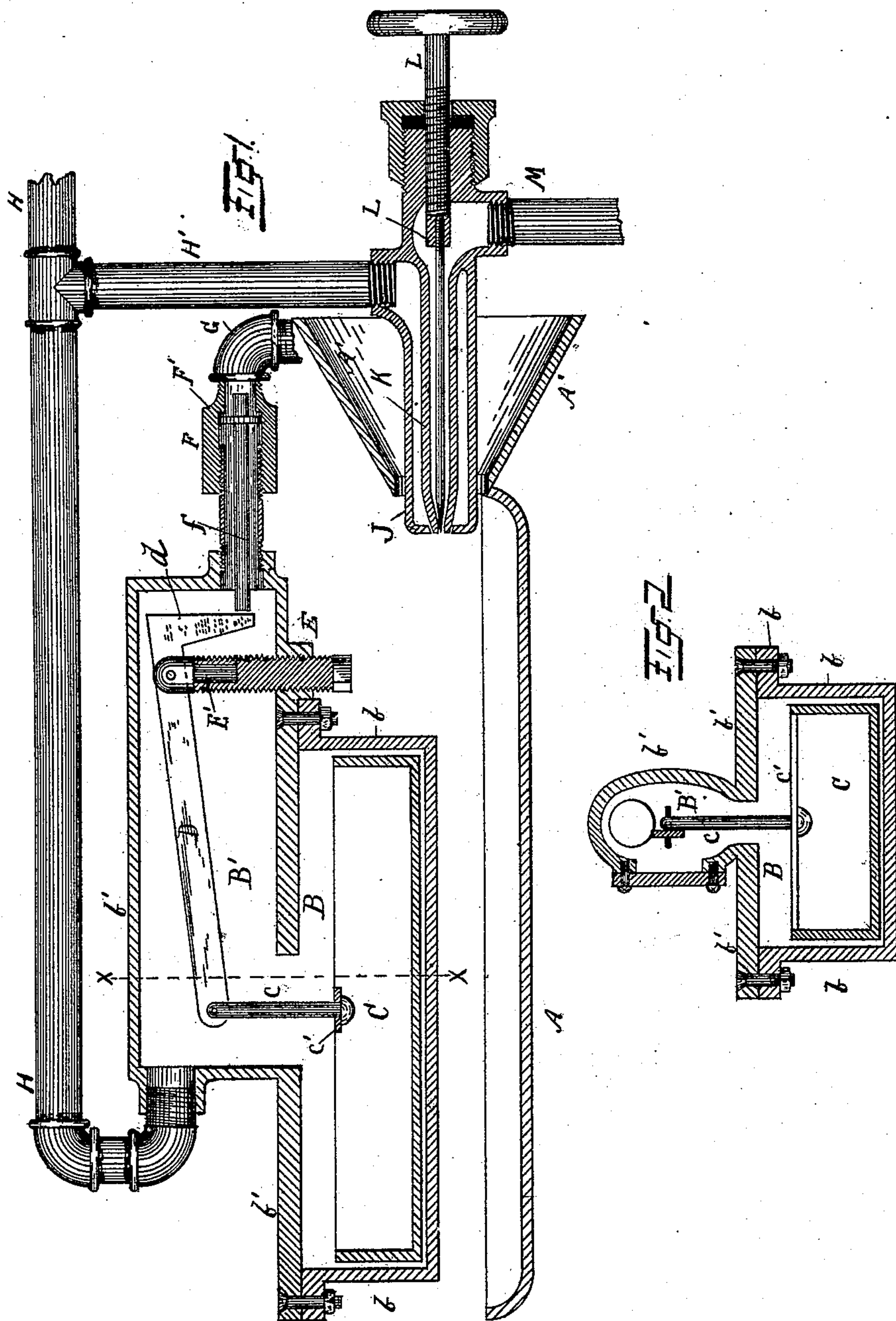


(No Model.)

W. N. BARRETT.  
STEAM GENERATOR.

No. 471,333.

Patented Mar. 22, 1892.



WITNESSES -

Wm Marks Jr.  
J. D. Otto

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attys



# UNITED STATES PATENT OFFICE.

WILLIAM N. BARRETT, OF MEADVILLE, PENNSYLVANIA, ASSIGNOR TO THE  
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## STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 471,333, dated March 22, 1892.

Application filed May 6, 1891. Serial No. 391,737. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM N. BARRETT, a citizen of the United States, residing at Meadville, in the county of Crawford 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 appertains to make and use the same.

This invention relates to steam-generators; and it consists in certain improvements in the construction thereof, as will be hereinafter fully set forth, and pointed out in the subjoined claims.

The invention is illustrated in the accompanying drawings, as follows:

Figure 1 is a longitudinal vertical sectional view of my device, and Fig. 2 is a transverse section on the line  $x x$  in Fig. 1.

The first part of the invention relates to the boiler and means for admitting water thereto and conveying the steam therefrom, and the second part of the invention relates to means for heating the boiler.

The construction and operation of the device is as follows, reference being had to the drawings and the letters of reference marked thereon.

The boiler consists of two chambers B and B', of which B is the steam-generating chamber, and B' the steam-drum or steam-space. The boiler is formed of the castings  $b$  and  $b'$ , which are bolted together, as shown, the casting  $b$  forming the steam-generating chamber B and  $b'$  the steam-space B', which is above the generating-chamber. The casting  $b$  is in the form of a box and may be of such size and form as is desired, and the base of the upper casting  $b'$  serves as a complete cover to the lower chamber, while the upper chamber is much smaller than the lower chamber.

In the chamber B is a water-pan C, which is suspended by the bail-bar  $c'$  and a link  $c$  from a lever D  $d$  in the upper chamber, which lever is journaled in a fulcrum-block E', which is swiveled at the upper end of a screw-post E. The short end  $d$  of the lever D  $d$  is at right angles to the long end D, and the stem  $f$  of a valve F' sets against the side of the short end

$d$ . By raising or lowering the lever D  $d$  by turning the screw-post E the end of the valve-stem  $f$  is brought near to or away from the plane of the fulcrum of the lever, and thus the pressure to be exerted by the valve-stem  $f$  against the lever D  $d$  can be properly adjusted, so as to effect the lifting up of the pan C when empty or partially empty, as desired. The valve F' when seated closes the opening through the nipple F, which is connected with a water-supply pipe G. The pressure of the water from the pipe G against the valve F' will drive it away from its seat whenever the weight of the pan C and its contents is insufficient to hold the valve against its seat. When the valve is pressed off its seat, water will flow past it and enter the chamber B' and flow down into the pan C in the chamber B, and as soon as enough water is in the pan to give it sufficient weight to hold the valve F' against its seat the water will of course cease to flow.

The boiler B B' is suspended in any way desirable over a fire, and water contained within the pan will be converted into steam and fill the chamber B' and from thence flow off through the pipe H. As soon as the water has been sufficiently evaporated to make the pan light enough to be lifted by the pressure of the water acting on the valve F' more water will flow in and take the place of that which has been evaporated. So it will be seen that a supply of water is automatically let into the pan as fast as it is required and no faster.

Such a generator as this just described is particularly adapted for supplying low-pressure steam for heating purposes; but I do not intend to be limited to the use of the device for any particular purpose.

The generators can be built for large or small capacity and can be used in connection with any form of burner or furnace. In Fig. 1 I show it in combination with a hydrocarbon-burner and so applied as to furnish the steam which is used in the burner. The construction and operation of the device in this respect are as follows: J is the outer shell of an injector, and K is the inner pipe, and L is the regulating and shut-off valve. These features are common in hydrocarbon-burners and may be varied to suit the builder. In fact,



any ordinary hydrocarbon atomizing burner may be used. The pipe H' connects with the steam-pipe H and the pipe M connects with the oil or gasoline or, if used, the gas supply.

5 A' is a cone through which the atmospheric air is admitted to the flame, and A is the oil-pan used to start the device in operation by burning oil or gasoline in it, as is common in this class of burners.

10 The operation of a hydrocarbon-burner is well understood and need not be here described; but it will be understood that the flame from the burner J K L will heat the boiler B B', and the steam generated therein  
15 will to the extent required be used in the said burner, and the residue will pass off through the pipe H for use as desired.

I am aware that it is not new to generate within the flame of a hydrocarbon-burner the  
20 steam which is used in said burner, and shall not broadly claim that feature of my device.

What I claim as new is—

1. In a steam-generator, the combination of a boiler, a water-pan contained within said  
25 boiler, which holds the water to be converted into steam, a scale-beam lever which will raise said pan, when the water contained therein falls below a desired amount, through the action of a counteracting force applied to said  
30 scale-beam, a water-supply pipe entering said boiler in position to supply water to said pan, and a valve closing said water-supply pipe, which is operated from said lever so as to open said valve when the water-pan is lifted  
35 by said lever.

2. In a steam-generator, the combination of a boiler having a generating-chamber and a steam-space, a water-pan vertically movable in  
40 said generating-chamber, and a lever within the steam-space, which is connected at one end with said pan, so as to vertically move the same, and at the other end with the stem of a valve which closes a water-supply pipe, so as to be moved by said valve when it is  
45 forced off its seat, whereby the supply of wa-

ter to the water-pan is automatically regulated through the counteraction upon said lever of the weight of said pan and its contents and the pressure of the water-supply.

3. In a steam-generator, the combination of 50 a generating-chamber, a steam-space, a water-supply pipe, a valve in said water-supply pipe, which opens inwardly, a lever acting against said valve to close it against the pressure of the water-supply, and a water-pan 55 which holds the water to be converted into steam and receives its supply from said supply-pipe, which is connected with said lever in a manner substantially as set forth, whereby the weight of said pan and its contents re- 60 sists the pressure of the water-supply upon said valve.

4. In a steam-generator, the combination of a boiler having the chambers B and B' arranged one below the other, a water-pan C 65 within the chamber B, a water-supply pipe entering the chamber B', an inwardly-opening valve F', closing said pipe, and a scale-beam lever D d within said chamber B', which is connected at one end with the water-pan, so 70 as to move the same vertically, and at the other end with the stem of said valve F', so as to be moved by said valve when it is forced off of its seat by the inwardly-acting pressure of the water-supply. 75

5. In a steam-generator, the combination of the generating-chamber B, the steam-space B' above said chamber B, the water-pan C in said chamber B, the lever D d in said steam-space, the vertically-moving fulcrum for said 80 lever, the valve-stem f of the water-supply valve F' in contact with the arm d of said lever, and the connection c, connecting said water-pan to the arm D of said lever.

In testimony whereof I affix my signature in 85 presence of two witnesses.

WM. N. BARRETT.

Witnesses:

JNO. K. HALLOCK,  
WM. P. HAYES.