

No. 713,048.

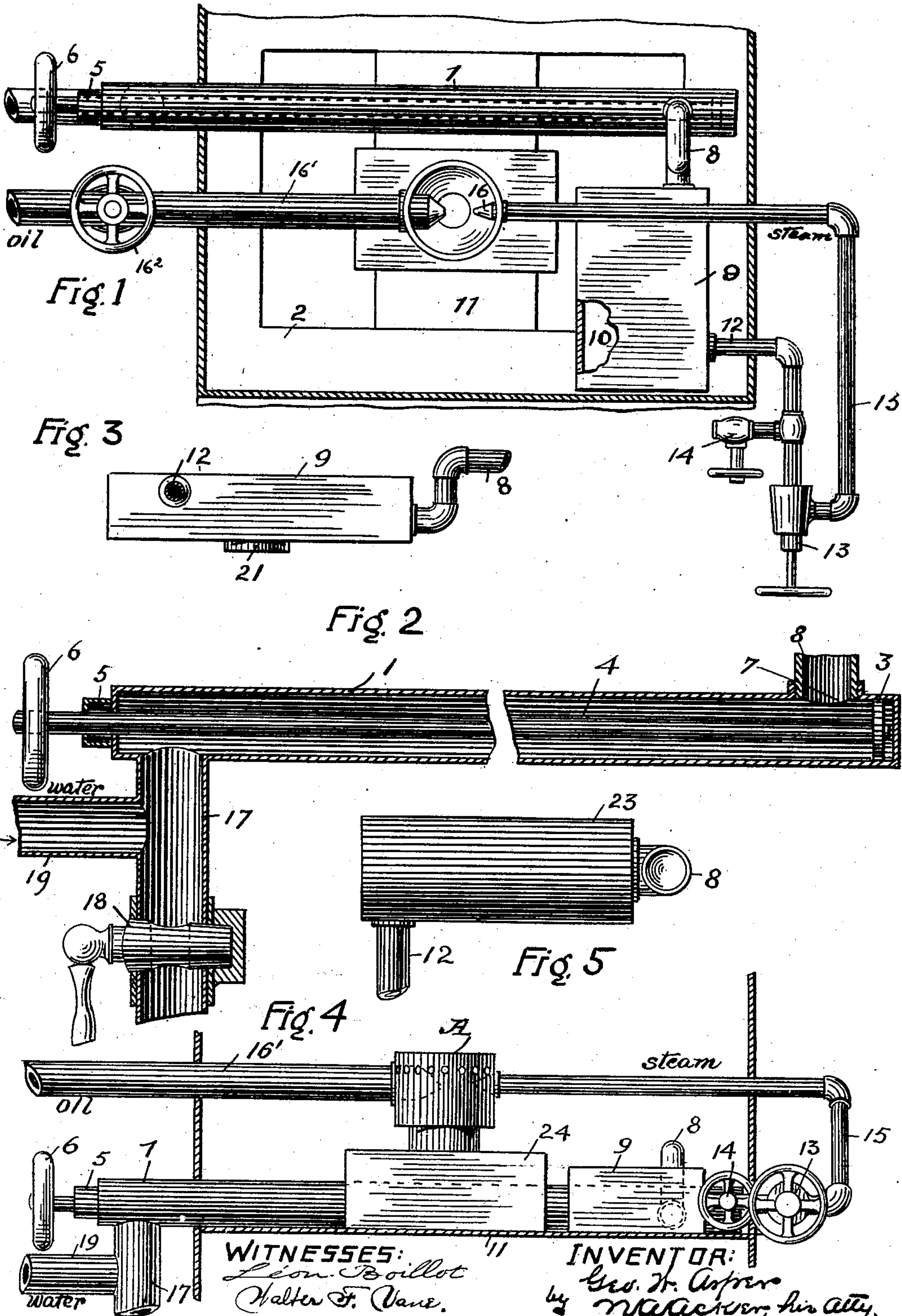
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G. W. ARPER.

STEAM GENERATOR FOR HYDROCARBON BURNERS.

(Application filed Apr. 3, 1902.)

(No Model.)



WITNESSES:  
Leon Boillot  
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# UNITED STATES PATENT OFFICE.

GEORGE W. ARPER, OF OAKLAND, CALIFORNIA.

## STEAM-GENERATOR FOR HYDROCARBON-BURNERS.

SPECIFICATION forming part of Letters Patent No. 713,048, dated November 11, 1902.

Application filed April 3, 1902. Serial No. 101,186. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. ARPER, a citizen of the United States, residing at Oakland, county of Alameda, State of California, have invented certain new and useful Improvements in Steam-Generators for Hydrocarbon-Burners; and I do hereby declare the following to be a full, clear, and exact description of the same.

10 The present invention is more particularly designed for use in connection with oil-burners utilized in connection with stoves, ranges, and furnaces; and the object of the invention is to provide against dirt or sediment  
15 contained in the water clogging the jet orifice or outlet for the steam.

In order to comprehend the invention, reference should be had to the accompanying sheet of drawings, wherein—

20 Figure 1 is a horizontal sectional plan view of an ordinary oil-burning cooking-stove with the steam-generator applied thereto. Fig. 2 is a longitudinal sectional view of the feed-water drum; Fig. 3, a detail view of the steam  
25 chamber or box. Fig. 4 is a cross-sectional end view of the stove with generator applied thereto; and Fig. 5 is a detail view of a modification of the steam-chamber.

In the drawings the numeral 1 is used to  
30 indicate the feed-water drum, which drum may be located inside or outside of the stove 2. This feed-water drum is closed at its ends, and within same is situated the plunger 3, which is attached to the inner end of rod 4.  
35 The free end of this rod extends through a stuffing-gland 5 in the outer end of the feed-water drum and has secured thereto the handle 6. In the top portion of the said feed-water drum, near its inner end, is formed an  
40 outlet 7, with which connects the reduced pipe 8. This pipe forms connection between the feed-water drum and the casing or box 9, the interior of which forms a steam-chamber 10. The pipe 8 enters this chamber at or near  
45 its bottom, Figs. 3 and 4 of the drawings.

The casing or box 9 is situated within the fire-box 11 of the stove a distance below the oil-burner A, fitted therein. Through this casing, near its top, extends one end of the  
50 steam-outlet pipe 12, the opposite end of which projects beyond the front of the stove 2 and has attached thereto the steam-controlling

valve 13. This pipe is also provided with a blow-off cock 14. From the steam-controlling valve 13 extends the return-pipe 15, the free  
55 end of which projects into the fire-box 11 of the stove and has attached thereto the jet-nozzle 16, through which steam is ejected into the flame of the oil-burner. Oil is admitted to the fire-box 11 by means of the oil-  
60 supply pipe 16', the flow of oil therefrom being regulated or controlled by the hand-valve 16<sup>2</sup>, Fig. 1 of the drawings.

To the feed-water drum, near its outer end, is connected a waste-pipe 17, the outlet of  
65 which is controlled by valve 18. Into said pipe 17, above the valve 18, extends the water-supply pipe 19, which admits water into the drum 1, the supply of water being controlled by a suitable cock.  
70

To operate the generator, a fire is kindled within the fire-box 11 of the stove by the use of oil or other suitable material, so as to heat the pipes and the casing or box 9. The pipes and box being suitably heated to generate  
75 steam in chamber 10, water is admitted to drum 1 from the water-supply pipe 19 by opening its cock, the waste or blow-off cock 14 being opened to permit any condensation which may have taken place to escape. By  
80 means of this waste-cock I also determine whether the requisite steam has been generated within the chamber 10. The waste-cock is then closed and steam-controlling valve 13 opened, so that the generated steam is per-  
85 mitted to escape into the fire-box of the stove through the jet-nozzle 16. It will be understood that during this operation oil is admitted into the fire-box 11 from the supply-pipe 16', valve 16<sup>2</sup> being opened for such purpose.  
90 Such sediment as may be contained in the water is mainly precipitated in the drum 1 and is removed therefrom by withdrawing the plunger 3 by means of the handle 6, attached to the outer end of rod 4. As this plunger  
95 is drawn outward all dirt, sediment, or accumulation deposited within the drum is forced into the waste-pipe 17 and permitted to escape therefrom by opening the valve 18. If necessary, water from the supply-pipe may  
100 be used to wash said deposited material from within the waste-pipe. Inasmuch as the collecting-drum 1 is considerably larger than the inlet and outlet pipes thereof, it is be-



lieved that all foreign substance contained within the water will be deposited within said drum and that the steam-chamber 10 will be free from any such deposit, especially as the connection-pipe 8 leads from the top or near the top of said drum. However, should any deposit be made within the steam-chamber 10 it may be readily removed therefrom by withdrawing plug 21 from the bottom of the casing or box 9.

It will be understood that there is an initial quantity of water within the feed-water drum for the generation of steam and that the controlling-valve of the water-supply pipe is not opened to admit of water to water-feed drum until the pressure of steam within the steam-chamber equalizes the pressure of water in the water-supply pipe. The steam-pressure will thus automatically regulate the supply of water, the outlet of steam to the jet-nozzle being regulated by valve 13. Inasmuch as the outlet-pipe 12 leads from the top of the steam-chamber, such foreign matter as may be contained in the water is prevented from finding its way to the jet-nozzle and clogging thereof is avoided. When it is desired to shut off the supply of steam, the admission of water to the water-feed drum is destroyed, the valve of the steam-pipe remaining open for a short time to permit of all generated steam exhausting. All supply of oil being cut off from the oil-burner, the fire is put out, when the pipes of steam-generators readily cool off.

It is obvious that instead of a box or casing 9 being interposed between the water-feed drum and the jet-outlet the same result may be accomplished by simply utilizing a pipe-section 23 of an area greater than the connection to the water-feed drum and outlet-pipe for the steam generated in such enlarged pipe-section, Fig. 5 of the drawings. Such construction is within the scope of my invention, inasmuch as it serves the purpose of a steam-generating chamber interposed between the connection from the feed-water

drum and the outlet-pipe for the generated steam.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A steam-generator for oil-burners, the same comprising a feed-water drum having an inlet-opening at one end and an outlet-opening at its opposite end, a steam-generating chamber, a pipe connection between said chamber and the outlet-opening of the feed-water drum, a valve-controlled outlet-pipe for the steam-chamber, an oil-burner with which the steam-pipe communicates, and a movable plunger for removing sediment from the feed-water drum, said plunger normally occupying a position beyond the outlet-opening in said drum; substantially as described.

2. In a steam-generator, the combination with a feed-water drum, having an inlet-opening at one end and an outlet-opening at its opposite end, a valve-controlled waste-outlet pipe leading from the drum at the feed end thereof, and a movable plunger for removing sediment from the drum and discharging the same into the waste-outlet pipe, said plunger normally occupying a position beyond the outlet-opening of said drum; substantially as described.

3. In a steam-generator, the combination with a feed-water drum having inlet and outlet openings, a valve-controlled waste-outlet pipe leading from the drum, a movable plunger for removing sediment from the drum and discharging the same into the waste-outlet pipe, said plunger normally occupying a position beyond the outlet-opening in the drum and at the end thereof away from the waste-outlet pipe; substantially as described.

In witness whereof I have hereunto set my hand.

GEORGE W. ARPER.

Witnesses:

N. A. ACKER,

D. B. RICHARDS.