(No Model.)

J. A. FORBES.

PORTABLE STEAM GENERATOR.

No. 303,566. Patented Aug. 12, 1884.

Fig. 1.

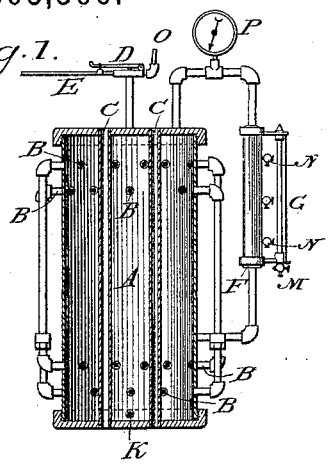


Fig. 3.

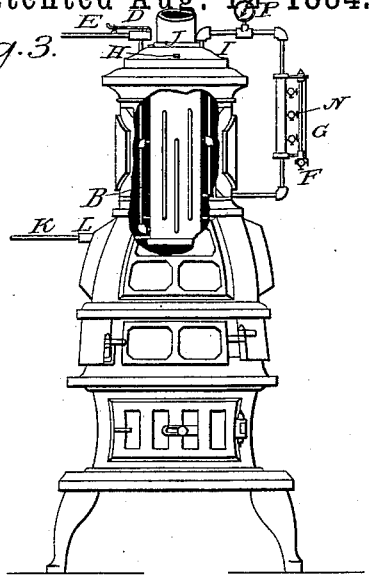


Fig. 2.

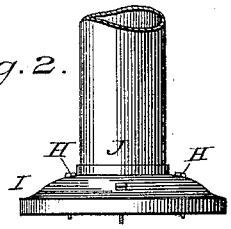


Fig. 4.

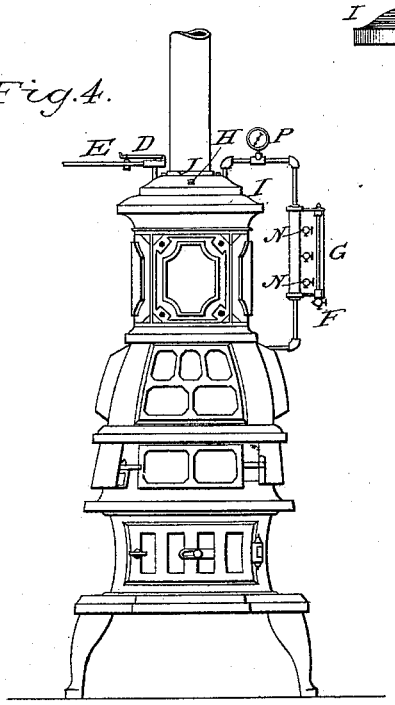
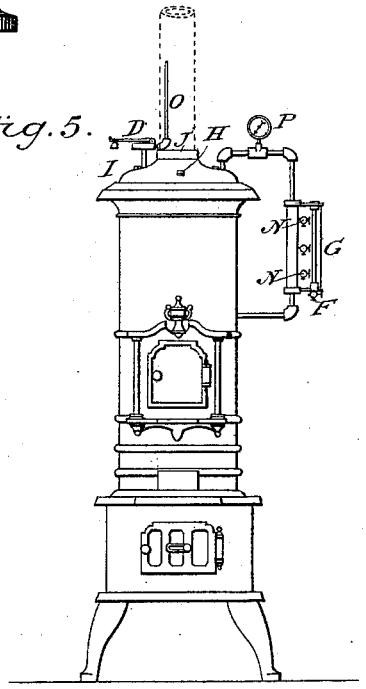


Fig. 5.



Witnesses:

Samuel D. Smith

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UNITED STATES PATENT OFFICE.

JOHN A. FORBES, OF DOVER, DELAWARE, ASSIGNOR OF ONE-HALF TO JAMES H. WILSON, OF SAME PLACE.

PORTABLE STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 303,566, dated August 12, 1884.

Application filed March 11, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. FORBES, of Dover, in the county of Kent and State of Delaware, have invented certain new and useful Improvements in Steam-Generators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The object of my invention is to produce a steam generator or boiler, first, that will be cheap and within the reach of all persons requiring or desiring steam for power or for heating purposes; second, that can be easily repaired; third, that is made of materials which can be had in almost every town and village, so that any necessary repairs can be done at home; fourth, that is of such shape and so constructed as to be placed in any heating-stove, so that any family having one of these generators can, by placing it in a stove and by adding conducting-pipes and radiators, heat their dwellings by steam at the minimum cost for fuel; fifth, that can be used for heating railroad-cars by steam with the smallest possible amount of fire, thereby doing away with most of the danger arising from the stoves and heaters at present used for heating cars, when, in cases of accidents, the same are overturned. In such cases the water in my generator, when overturned and broken, will extinguish the fire, and as a few pounds of steam-pressure would be amply sufficient for heating purposes, there could be little or no danger from the escaping steam. Therefore, with my generator for heating cars one of the greatest dangers from collision or other railroad accidents would be removed, namely, fire.

My generator can be readily set in masonry, as well as attached to an ordinary heating-stove.

In the drawings, Figure 1 is a perspective view of the generator, showing the heat-flues running through the main boiler and the water-tubes on the outside with their connections, also the gages, &c. Fig. 2 is a view of the stove-cap and the smoke-pipe, showing the bolts for supporting the generator when placed in a stove. Fig. 3 is a view of the generator as it appears in a stove. Fig. 4 is a view of a parlor-stove with the generator attached. Fig. 5 is a view of an ordinary sheet-iron stove with the generator attached.

In the drawings, similar letters of reference designate corresponding parts in all the figures.

A is the main boiler or reservoir. B are the water-tubes connected at the top and bottom of the main boiler A, as shown in Fig. 1. C are the heat-flues running through the boiler A. D is the safety-valve. E is the pipe for conducting the steam. F is the water-column. G is the glass water-gage. H are the bolts in the cap I for supporting the generator. I is the cap for the stove. J is the smoke-pipe. K is the feed-pipe or pump-connection. L is the check-valve. M is the drip to the water-gage. N are the try-cocks on the water-column F. O is the blow-off pipe. P is the steam-gage.

In my generator I secure the greatest amount of heating-surface possible for the size of the apparatus, the fire being directly under the generator, thus utilizing to the utmost the heat employed.

When the generator is placed in a stove or set in masonry, no part of it comes in contact with the outer wall of the stove or of the brick-work; but in either case the generator will be supported by the bolts in the cap, thus allowing the heat to pass freely around the small water-tubes, as well as through the heat tubes or flues in the main boiler.

My generator is constructed out of regular sizes of wrought steam-pipe, and is very simple in construction, very cheaply made, and easily repaired and kept clean. Being made in different sizes, it can readily be attached to any ordinary heating-stove by selecting the proper size for the stove in which it is to be placed. It can also be satisfactorily set in masonry. By the use of this generator a great saving in fuel can be had for the amount of steam generated, and this is largely due to the fact that all the heat possible is utilized, as above shown. My invention can be satisfactorily employed in all ordinary heating purposes, especially for heating houses and cars; and in cases where steam is employed for culinary purposes my invention will be found valuable. It will also sup-

ply a long-felt need in cases where small steam-power is required either for manufacturing or agricultural purposes.

Having now fully described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

In a steam-boiler adapted to be placed in a stove, a cylinder of wrought steam-pipe having caps screwed onto each end thereof, in combination with circulating-tubes composed of sections coupled by means of union-joints, and attached to the sides of said cylinder by means of nipples and ells, and fire-tubes extending through the interior of the said cylinder, substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

JOHN A. FORBES.

Witnesses:

R. R. KENNEY,

JOHN S. JESTER.