

S. L. LANGDON.  
Steam-Boiler.

No. 224,447.

Patented Feb. 10, 1880.

Fig. 1.

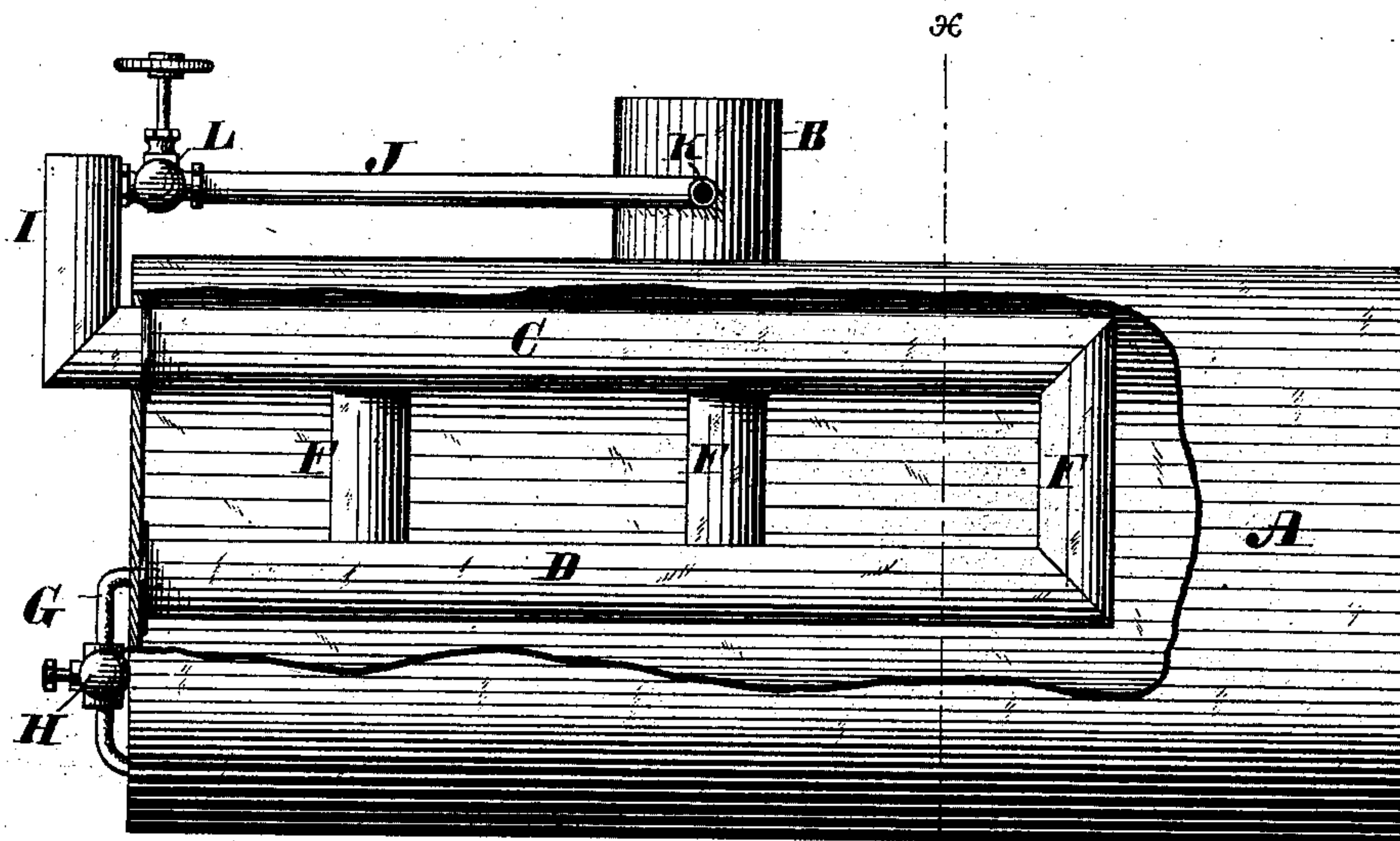
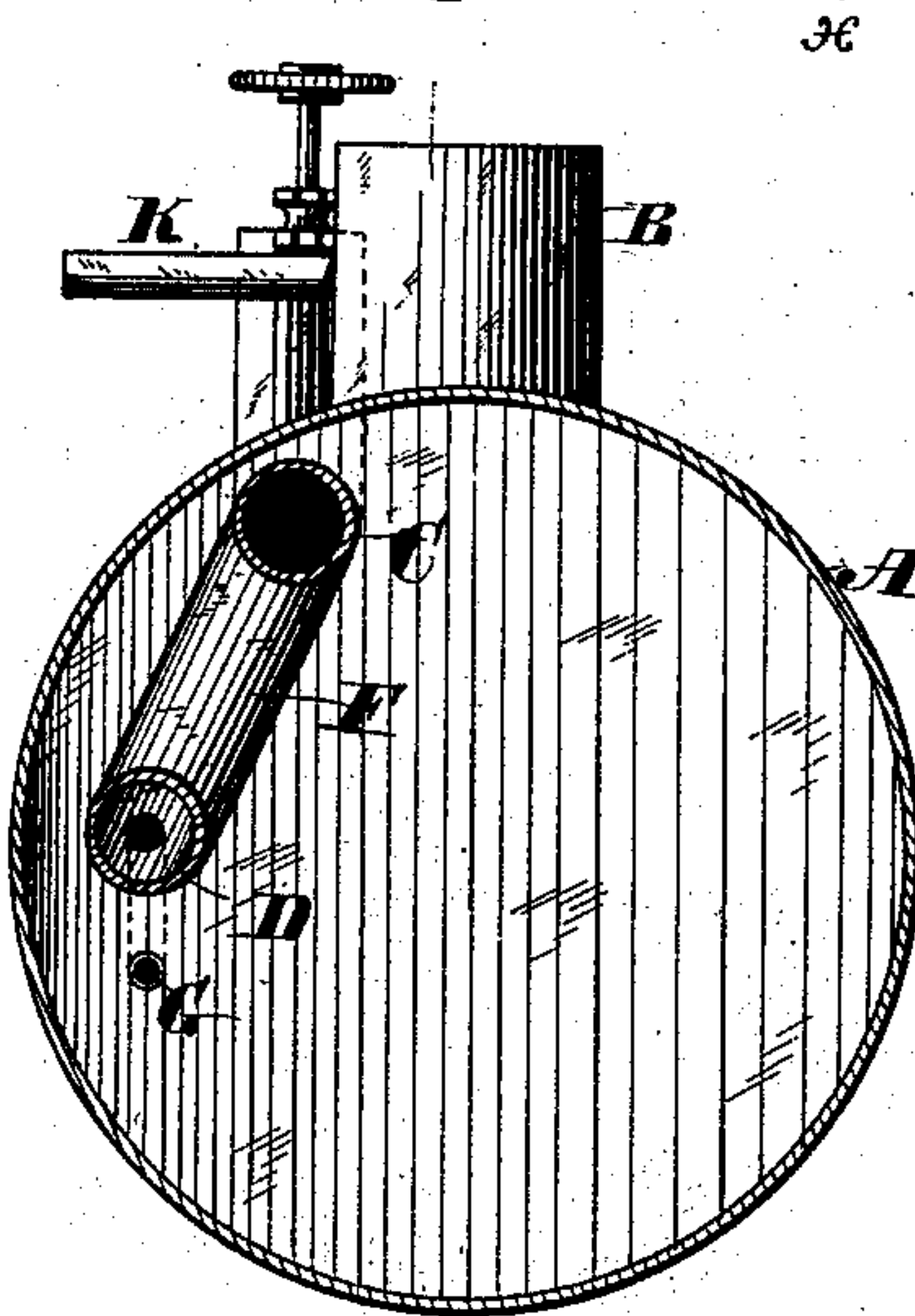


Fig. 2.



WITNESSES:

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 J. Henry Kaiser

INVENTOR.

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Att'y.



# UNITED STATES PATENT OFFICE.

SYLVESTER L. LANGDON, OF NEW ORLEANS, LOUISIANA.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 224,447, dated February 10, 1880.

Application filed November 15, 1879.

*To all whom it may concern:*

Be it known that I, SYLVESTER L. LANGDON, of the city of New Orleans, parish of Orleans, and State of Louisiana, have invented certain  
5 new and useful Improvements in Steam-Boilers, of which the following is a specification.

The object of this invention is to prevent foaming and priming in steam-boilers; and to  
10 this end the invention consists in the combination, with a main boiler, of an auxiliary boiler, which is connected with the water and steam spaces of the main boiler, and is furnished with  
15 suitable stop-cocks for opening and closing communication from said auxiliary boiler to the water and steam spaces of the main boiler, whereby the greater pressure of steam in the  
auxiliary boiler can be discharged, when required, into the main steam-boiler having less  
20 steam-pressure, forcing the foaming water in the latter down to its lowest possible level, while increasing the working volume of steam and permitting only dry steam to escape  
through the steam-pipe from the main boiler, and at the same time preventing foaming in  
25 the latter, owing to the foam being forced down by the greater pressure of steam from the auxiliary boiler, thus lessening the danger of burning or explosion.

In the accompanying drawings, Figure 1  
30 represents a side elevation, partly in section, of a boiler provided with my invention; and Fig. 2 is a transverse section of the same on line *x x* of Fig. 1.

Referring to the drawings, the letter A indi-  
35 cates a boiler, which may be of any known construction, either locomotive or stationary, and B indicates the usual steam-dome.

The auxiliary boiler is in the present instance  
40 arranged within the main boiler, and it consists of the upper and lower horizontal pipes or cylindrical chambers, C D, connected by three or more intermediate pipes, F F. The  
outer ends of the horizontal pipes C and D are attached to the head of the main boiler by  
45 flanges and rivets or bolts and screws, and the lower one, D, of the horizontal pipes is the water-pipe, and at its outer end it is connected with the water-space of the main boiler by  
means of a connecting-pipe or water-passage,  
50 G, which is furnished with a suitable stop-cock, H, for opening and closing communica-

tion between said water-space of the main boiler and the lower pipe, D, to admit water to the latter. The upper horizontal pipe or chamber, C, projects through the head of the main  
55 boiler, and is provided with a vertically-extending chamber or pipe, I, which, in connection with the pipe C, forms the steam-drum of the auxiliary boiler. The upper end of the  
steam-drum I is connected by a horizontal  
60 pipe, J, with the main steam-pipe K, which leads from the steam-dome B of the main boiler, and said connecting-pipe J is furnished with a suitable cock, L, for opening and closing  
65 communication between the steam-drum I and the steam-space of the main boiler.

The operation of the auxiliary boiler is as follows: The steam generated in the pipe or  
chamber D passes through the connecting-  
70 pipes F to the upper horizontal pipe or steam-drum, C and I, and is there held by reason of the valves H and L being both closed until the steam-pressure increases five or ten pounds,  
more or less, to the steam-pressure in the main boiler. The pressure in the auxiliary boiler hav-  
75 ing been raised to the required point, the valve or cock L is opened, and the increased pressure of steam in the auxiliary boiler escapes  
through the steam-pipe J into the main steam-  
80 pipe K, thereby causing the foaming water in the main boiler to be forced down to its lowest level by reason of the higher pressure being discharged onto the lower pressure of steam,  
thereby avoiding foaming while increasing the  
85 working volume of steam, and at the same time preventing priming.

The increased volume of steam in the main boiler can be maintained at will by closing  
the valves H and L and afterward opening  
90 valve L at the required intervals to admit a supply of the higher-pressure steam to the main boiler until the pressure in the two boilers is equalized, and when such is accomplished  
the valve H is opened and a supply of water  
95 from the water-space of the main boiler admitted to the pipe or chamber D of the auxiliary boiler through the connecting water-pipe G. By this means is provided an auxiliary power,  
under control of the attendant, which can be  
100 utilized when required, and which subserve the purpose of preventing or annihilating the foam, and permitting nothing but dry steam to



escape to the cylinders, thus preventing priming.

I have illustrated and described the auxiliary boiler as arranged within the main boiler; but it is evident that it may be connected to the outside of the same, or be located at a suitable distance therefrom.

Having fully described my invention, what I claim is—

10 1. The combination, with a main boiler, of a supplementary boiler arranged within said main boiler, a pipe connecting the water-spaces, and another pipe connecting the steam-spaces, of said boilers, each of said pipes being provided with a stop-cock, by which the passage of steam and water from one boiler to the other may be controlled, substantially as set forth.

20 2. The combination, with a main steam-boiler, of an auxiliary boiler consisting of two pipes or chambers, C D, intermediate connecting-pipes, F, and pipes G and J, connecting the said pipes or chambers, respectively, with the wa-

ter-space and the steam-space of the main boiler, for discharging steam of a high pressure into steam of a lower pressure in the main boiler, substantially as and for the purpose described. 25

3. The combination, with the main steam-boiler, of the auxiliary boiler arranged within the same, and consisting of two horizontal pipes or chambers, C and D, intermediate connecting-pipes, F, vertical steam-drum I, steam-pipe J, connecting said drum with the steam-space of the main boiler, and the water-pipe G, connecting the lower pipe, D, with the water-space of the main boiler, said pipes G and J being provided with valves H and L, all substantially as and for the purpose described. 35

To the above I have signed my name this 11th day of October, 1879.

S. L. LANGDON.

Witnesses:

FRANCIS M. FISK,

W. L. POOLE.