

# W. ARTHUR. Steam Generator.

PATENTED JUN 21 1870

FIG. 1.  
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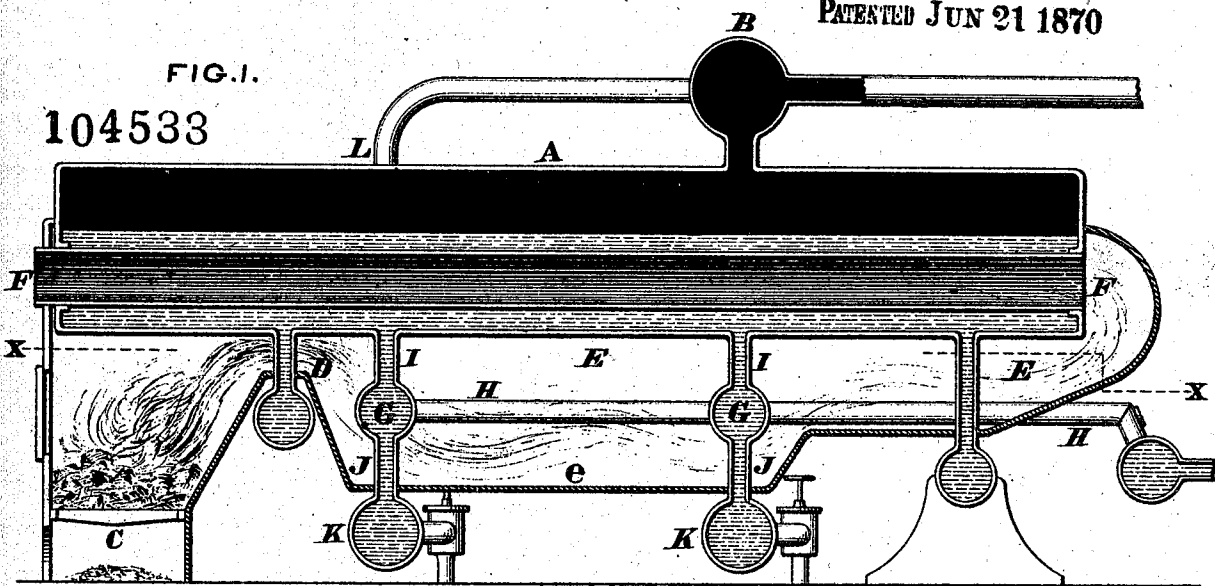


FIG. 2.

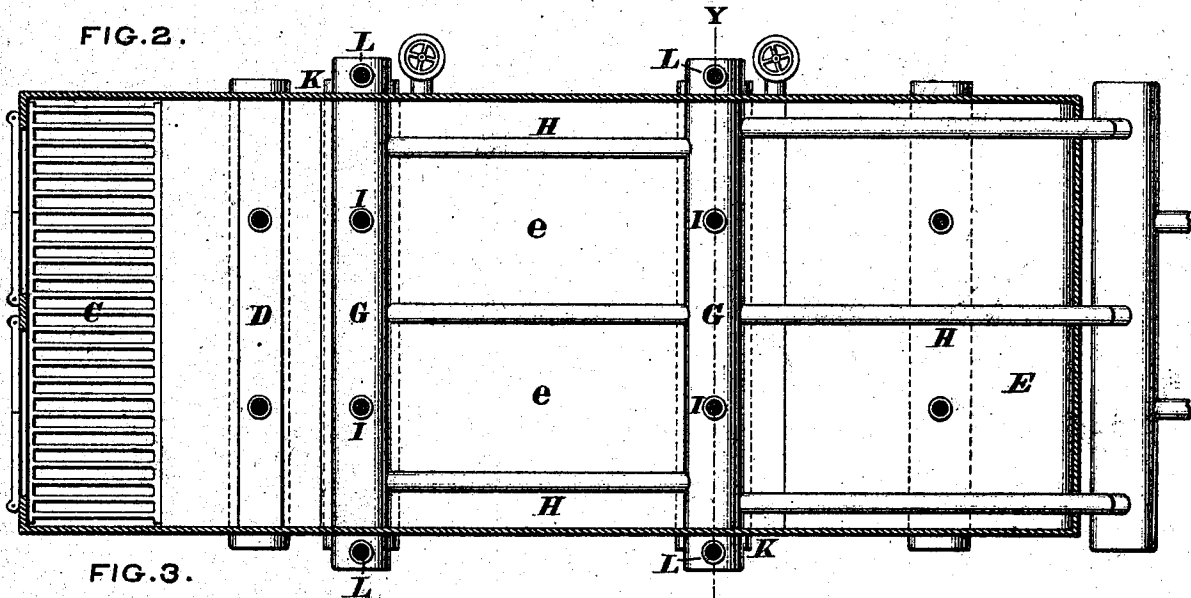
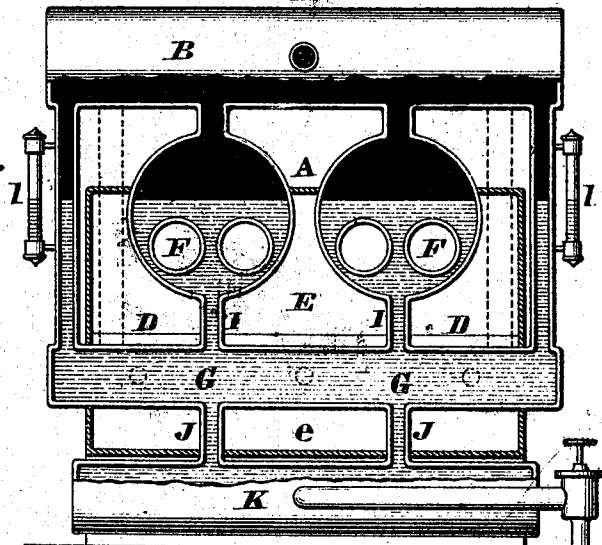


FIG. 3.



*W. Arthur*

INVENTOR.

*By Knights Bros Attyd.*

ATTEST.

*Gas. H. Sayman,  
William Bauer.*

# UNITED STATES PATENT OFFICE.

WILLIAM ARTHUR, OF NEWPORT, KENTUCKY.

## IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. **104,533**, dated June 21, 1870.

I, WILLIAM ARTHUR, of Newport, Campbell county, Kentucky, have invented a new and useful Steam-Generator, of which the following is a specification:

### *Nature and Objects of the Invention.*

The first part of my invention relates to an arrangement of pipes and drums within the smoke space or flue beneath the boiler, through which the feed-water is caused to pass and become heated; and the second part of my invention consists in combining therewith a direct connection or communication from said drums to the steam-space of the boiler.

### *General Description with reference to the Drawing.*

Figure 1 is a longitudinal section of a steam-generator embodying my improvements. Fig. 2 is a horizontal section of the same at the line X X. Fig. 3 is a transverse section of the same at the line Y Y.

A may represent one or more customary return-flue horizontal boiler or boilers, surmounted by the usual steam-drum B.

From the fire-place C, of any approved construction, the emanations of combustion are conducted over a bridge, D, into the flue E, which flue has a pit or depression, e, and communicates at its rear end, in the usual manner, with the return-flue F.

Extending athwart the flue E, at its depressed portion e, are one or more drums, G, into which the feed-water is forced by means of one or more pipes, H.

The drums G communicate, by ascending pipes I, with the boiler-bottom, and by descending pipes J with mud-receptacles K, of ordinary construction.

Pipes L, leading from the ends of the drums G to the steam-chamber B, enable the steam generated in the drums G to pass direct to said chamber, and thus facilitate the entrance of water into said drums, and promote circulation of water in the boiler.

In the absence of a steam-drum, the pipes L may conduct directly into the top of the boiler.

Gages l may be attached to the side pipes, L, for the purpose of indicating the height of water in the boiler; or, if preferred, said pipes L may be located within the flue E, as shown by dotted lines in Fig. 3, so as to stimulate the ascent of steam, and thereby promote circulation, and when the pipes L are thus located the gages, if used, will, of course, be secured to another part of the boiler.

The pipes I and J, being in line, permit the direct precipitation of mud from the boilers into the mud-receivers.

### *Claims.*

I claim herein as new and of my invention—

1. The arrangement of drum or drums G and pipes H I J, when arranged below the boiler and inside of the flue, substantially as and for the purpose set forth.

2. In the described combination with the elements of the preceding claim, the pipes L, conducting steam from the drums G to the steam-space of the boiler.

In testimony of which invention I hereunto set my hand.

WM. ARTHUR.

Witnesses:

GEO. H. KNIGHT,  
JAMES H. LAYMAN.