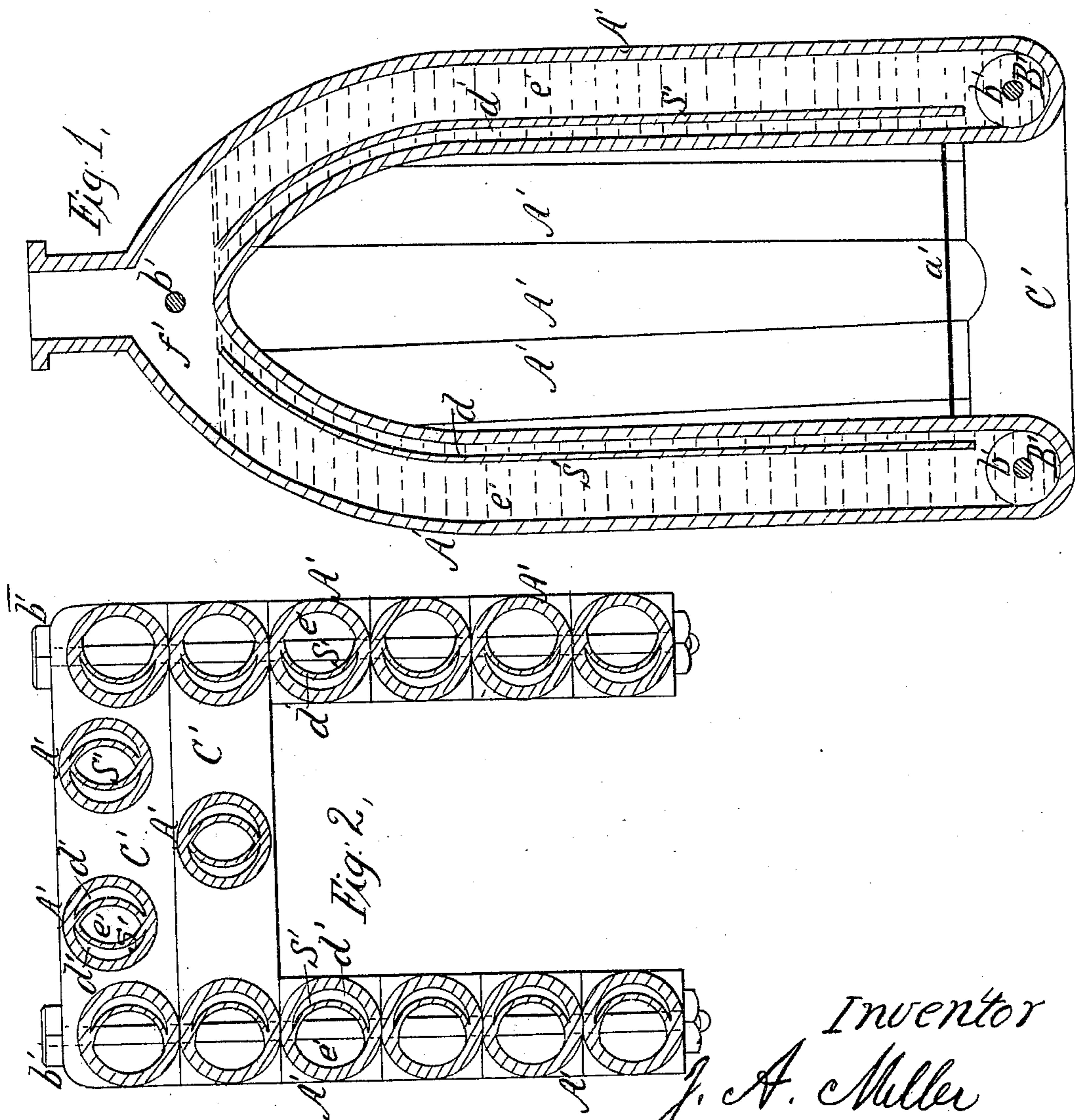


J. A. MILLER.  
STEAM GENERATOR.

No. 61,085.

Patented Jan. 8, 1867.



Witnesses;  
W. Sellers  
G. W. Reed

Inventor  
J. A. Miller  
by his attorneys  
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# United States Patent Office.

JOSEPH A. MILLER, OF NEW YORK, N. Y.

*Letters Patent No. 61,085, dated January 8, 1867.*

## IMPROVEMENT IN STEAM GENERATOR.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOSEPH A. MILLER, of the city, county, and State of New York, have invented a certain new and useful Improvement on Steam Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, marked A, forming part of this specification, and in which—

Figure 1 represents a vertical section of a steam boiler or main portion of one constructed according to my improvement; and

Figure 2 a horizontal section thereof.

Like letters indicate like parts throughout both figures.

The nature of my invention consists in a novel sectional construction of steam boilers by a combination of pipes made, say, of cast iron, arranged vertically along or around the sides and at the back of the fire-chamber, shaped as regards the side pipes to arch or cover in and form the roof to said chamber, such pipes being connected at their lower ends to horizontal or cross-pipes arranged below the level of the fire-grate, and being furthermore peculiarly constructed internally by the arrangement of diaphragms extending from a point or a level at or about the level of the fire-grate up to the water line, and situated in closer proximity to the surfaces on which the fire is brought to bear them to the opposite sides or surfaces of said pipes, thus forming a series of thin steam-generating surfaces and return-water ducts; the several pipes making up such sectional construction of boiler being tied or united together by bolts.

Referring to the accompanying drawing, A' represents pipes arranged up the sides and at the back of the fire-chamber, which latter may or may not be divided horizontally to form a return flue, or the fire and gaseous products passing out between the rear set of pipes be otherwise utilized. The series of these pipes forming the sides of the chamber stand in close proximity to each other, and are of arched or other suitable form at their tops so as to constitute a roof to the fire-box or chamber. Below the level of the grate *a'* the pipes A' are united to horizontal or cross-pipes B' C'. Bolts *b'* serve to unite or tie these several tubular sections together. Within the pipes A' are diaphragms S' extending from the water line, or thereabouts, to the level of the fire-grate, or thereabouts, and forming passages, *d' e'*, the one set, *d'*, of which receive the direct heat of the fire, to the exclusion of the others, *e'*, and constitute steam generators containing only a thin film or isolated sheet of water, while the other passages *e'*, connecting with the pipes B' C' below the grate, form return-water ducts, the steam generated from the passages *d'* entering the steam space *f'* above, (which may be connected with a dome,) without passing through any superincumbent body of water, while any water which may be carried up or over by steam from the passages *d'* will pass over into the return-water passages *e'*, that, being excluded from the direct action of the fire and being connected to the water spaces B' C' below the fire-grate, will be comparatively or wholly free from steam. By this construction, may not only steam be generated rapidly and economically, but its freedom from water is largely insured, while the sectional construction of the boiler and the simple manner in which it may be tied or united, combine both cheapness and strength. The water should be fed into the boiler below, outside of the steam-generating passages *d'*.

What I claim as my invention, and desire to secure by Letters Patent, is—

The sectional boiler constructed substantially as shown and described, and made up of pipes A', with their diaphragms S', constituting steam-generating spaces *d'*, and return-water passages *e'*, arranged in relation to the steam space and fire-grate of the boiler in combination with cross-pipes situated below the latter, the whole being bolted or united together, essentially as specified.

JOSEPH A. MILLER.

Witnesses:

A. LE CLERC,  
G. W. REED.