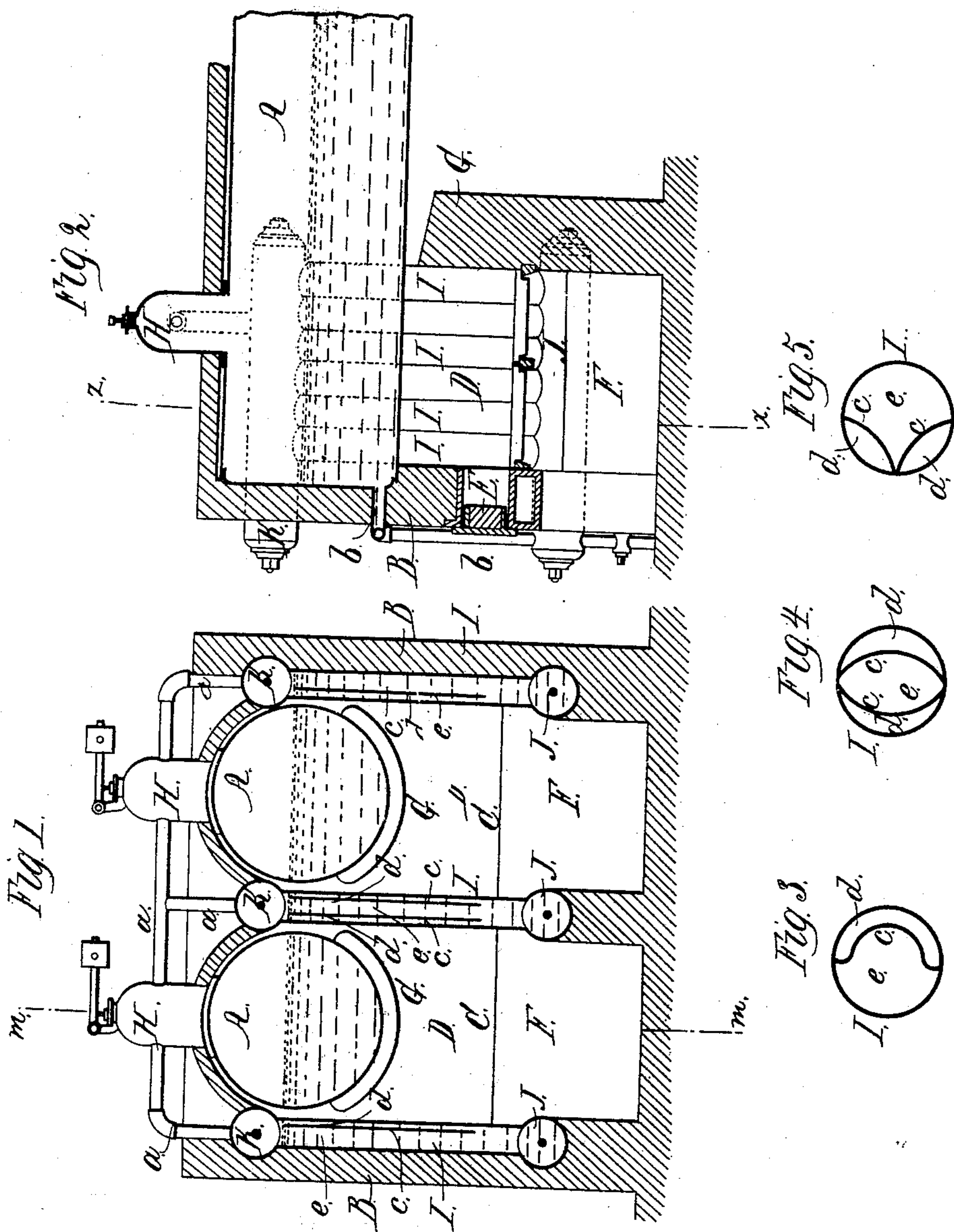


J. A. MILLER.
STEAM GENERATOR.

No. 62,494.

Patented Feb. 26, 1867.



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

Letters Patent No. 62,494, dated February 26, 1867.

IMPROVEMENT IN STEAM GENERATORS.

The Schedule referred to in these Letters Patent and in ~~the~~ 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 in Steam Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing marked B', forming part of this specification, and in which—

Figure 1 represents a transverse section of a double boiler having my improvement applied to it, taken as indicated by the line *x x* in fig. 2.

Figure 2, a longitudinal section of the same in part, taken as denoted by the line *m m* in fig. 1; and

Figures 3, 4, and 5, transverse sections on an enlarged scale of the boxes, pipes, or tubes, arranged round or on either side of the fire-box or chamber, under different forms of construction.

Like letters indicate like parts throughout the several figures.

The nature of this invention consists in a combination, with one or more boilers or steam generators of cylindrical or other form, arranged to project horizontally over a fire box or chamber, and having the heat applied directly thereto, or along it, of a series of pipes or boxes arranged on either side of the boiler furnace, and so constructed that while their lower part is below the fire grate, and their upper part above the water level of the boiler, and said pipes or boxes connected by a branch or branches with the steam and water spaces of the boiler or boilers, their interior is divided vertically by diaphragms into inner tubes or boxes, open at their ends, forming thin or contracted water and steam-generating spaces on either or both sides, reaching from a point at or near the line of the fire-grate to the water level of the boiler, or thereabouts, and constituting on the opposite sides of the diaphragms return-water spaces or ducts.

Referring to the accompanying drawing, A A are horizontal cylindrical boilers arranged parallel to each other, and of which there may be one, two, or more. These boilers are of any desired length and diameter, and set in suitable brick-work, B. C C are the grates; D D the fire-boxes or chambers, provided with doors E and ash-pits F. G G are the bridges at back of the grates, and H H steam domes on or to the boilers A A. The sides of the fire-chambers D D are made up of a series of vertically arranged boxes or pipes, I, in close proximity to each other, and connecting or forming part with, at their ends, horizontal boxes or pipes J K, the lower ones, J, of which lie below the line of the fire-grates, while the upper ones, K, are arranged just above, or thereabouts, the water level of the boilers A A, the former constituting water and the latter steam spaces, and being connected respectively by any suitable pipes, *b*, with the steam and water spaces of the boilers A A. These boxes or pipes I and J K may be of any desired shape in their transverse sections, not being necessarily cylindrical as here represented. The vertical pipes I also may be variously constructed, so far as regards the internal arrangement and form of a vertical diaphragm or diaphragms, *c*, are concerned. The main object of these diaphragms in the pipes I is to isolate the water in a thin film or sheet in proximity to the fire-chambers or heating surfaces of said pipes, the diaphragms *c* extending from points at or near the line of the fire-grates to the water level, or thereabouts, in the boilers A A, and forming distinct tubes or passages, *d e*; the ones *d* of which are open at both ends. These passages *d* constitute steam generators proper, the fire acting upon them, to the exclusion of the other passages, *e*, to rapidly convert into steam the thin film of water contained in and circulating upwardly through them, and the steam formed at their tops freely passing off into the steam space without having to work its way through a superincumbent body of water, while the other passages *e*, connecting as they do with the lower horizontal tubes J below the fire-grate, will be comparatively or wholly free from generating steam, and will serve as water ducts to return any water that may be lifted up by the steam generated by or in the smaller passages *d*, thereby keeping the steam entering the tubes K free from water, and by such steam, which is rapidly evolved, mixing with the vapor in the boilers A A, rendering dryer the steam in the latter.

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

The boilers A A, one or more of them, their fire-chambers D, and the boxes or pipes I, with their diaphragms, forming steam-generating spaces *d*, and return-water passages *e*, and pipes or boxes J K, when arranged in relation to each other and to the fire-grate, also to the steam and water spaces of the boiler or boilers, and in communication with the latter, substantially as specified.

Witnesses:

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