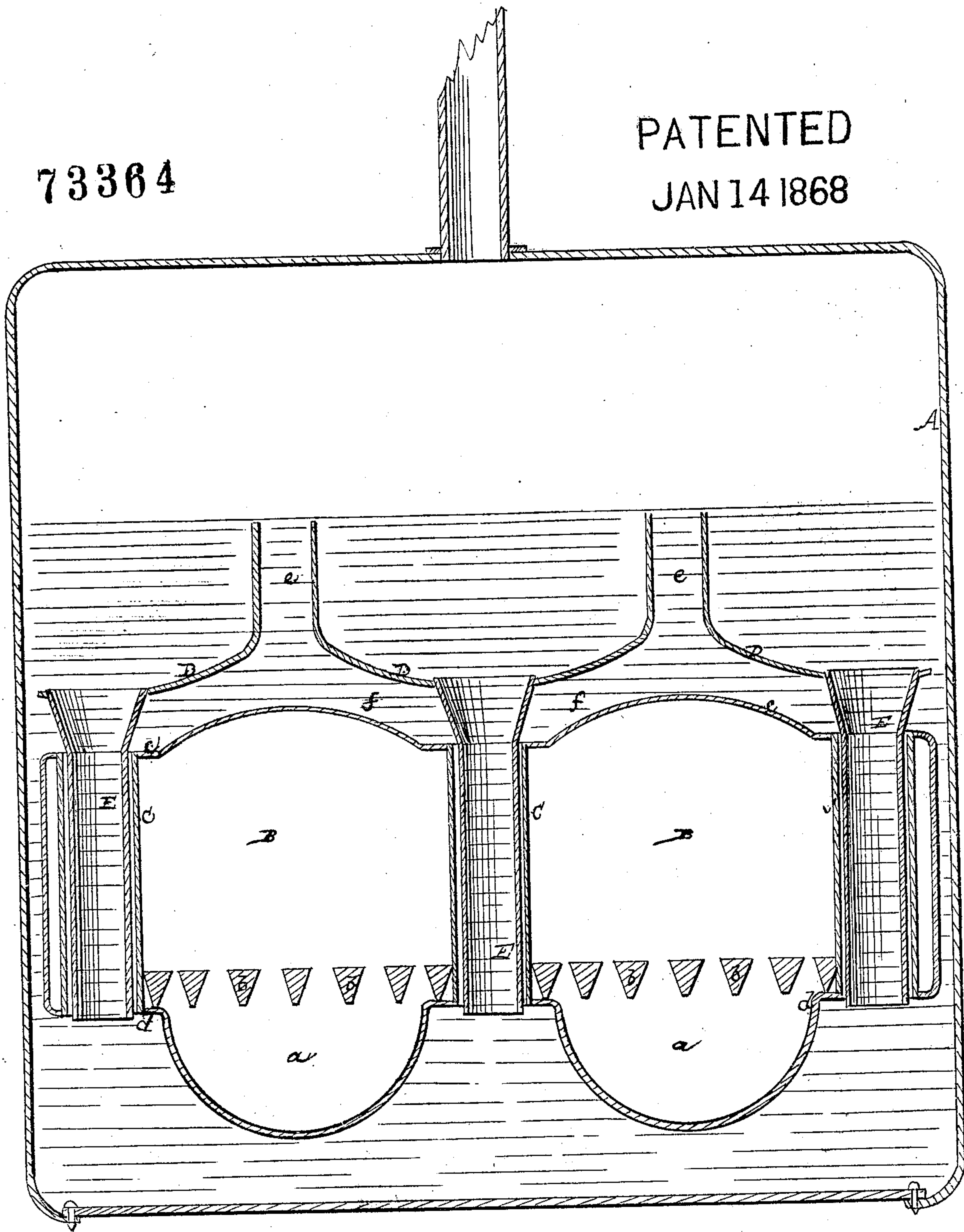


*J. A. Miller's Imp<sup>t</sup> in Steam Boilers (B.)*

73364

PATENTED

JAN 14 1868



Witnesses.

*M. Connolly  
A. Hellerey*

*J. A. Miller,  
per Brown & Connolly  
Attys.*

# United States Patent Office.

JOSEPH A. MILLER, OF PROVIDENCE, RHODE ISLAND.

*Letters Patent No. 73,364, dated January 14, 1868.*

## IMPROVEMENT IN STEAM-GENERATORS.

*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 Providence, in the county of Providence, and State of Rhode Island, have invented a 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, forming part of this specification, and which represents a sectional elevation of a steam-boiler constructed according to my improvement.

My invention consists in a combination of shields, arranged within the upper water-space of the boiler, with return-water and deposit-pipes or tubes open at both ends, and arranged to extend downwards between partitions or through tubes connecting the crown and lower sheets of the fire-box or boxes, and open at both ends for the circulation of water through them and around the return or deposit-pipes; and said invention also consists in the construction of the sides of the fire-box or boxes, of water-tubes open at both ends, and the combination of the crown and lower sheets of the latter in a close or bracing manner, as distinguished from a mere suspension of tubes closed at their lower ends.

A boiler thus constructed combines strength with economy, a large amount of heating-surface and active circulation of the water with a most effective and enlarged sediment or deposit-collecting surface, the sediment being deposited below the reach of the direct action of the fire.

Referring to the accompanying drawing, A is the outer shell or case of the boiler, containing within its water-space one, two, or more fire-boxes or chambers, B, with their ash-pits, *a*, and to which *b b* are the fire-bars. The flues to the smoke-stack may run from the rear of the fire-boxes, which have or may have their sides made up of vertical tubes, C, arranged one in rear of the other, on each fireplace side, to any desired extent, according to the length of the boiler, and which connect, so as to form braces, the crown-sheets *c* and lower sheets *d* of the fire-boxes. These tubes are open at both ends, and thus establish communication with the water-space above and below. In some cases, instead of the tubes C, partition or side plates may be used, with free water-spaces outside of or between them, and opening above and below, as in the case of the tubes, but tubes are preferable as regards strength, and in other respects. Above the fire-boxes, and arranged to extend over them, within the water-space of the boiler, are shields, D, running, it may be, the length of the boiler, and projecting up to the usual water-level, or thereabouts, but separated from each other and from the crown-sheets of the fire-boxes by water-spaces *e f*. These shields, which may have vertical sides, are bent or inclined to form bottoms, where they serve to direct sediment into collecting or conducting-tubes, E, suspended from or connected with said shields, and projecting or running down between the partition-plates to the sides of the fire-boxes or tubes C constituting said sides, with a narrow but free water-space, however, surrounding such tubes, and connecting the water-spaces above and below them to promote circulation of the water, rapid and economic generation of steam, and contributing to prevent foaming. The shields D, likewise, materially assist in these respects, the water having an ascending tendency or course, by the action of the fire, up round the sediment-tubes and under and up between the shields, and afterwards descending through the latter, and down said tubes, carrying sediment along with it to the bottom of the boiler, or below the direct action of the fire.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The combination of the tubes C and E with the shields D, crown-sheets *c*, and lower sheets *d*, substantially as specified.
2. The combination of the shields D with the sediment-tubes E and outer tubes C, essentially as herein set forth.

JOSEPH A. MILLER.

Witnesses:

CHARLES SELDEN,  
HENRY MARTIN.