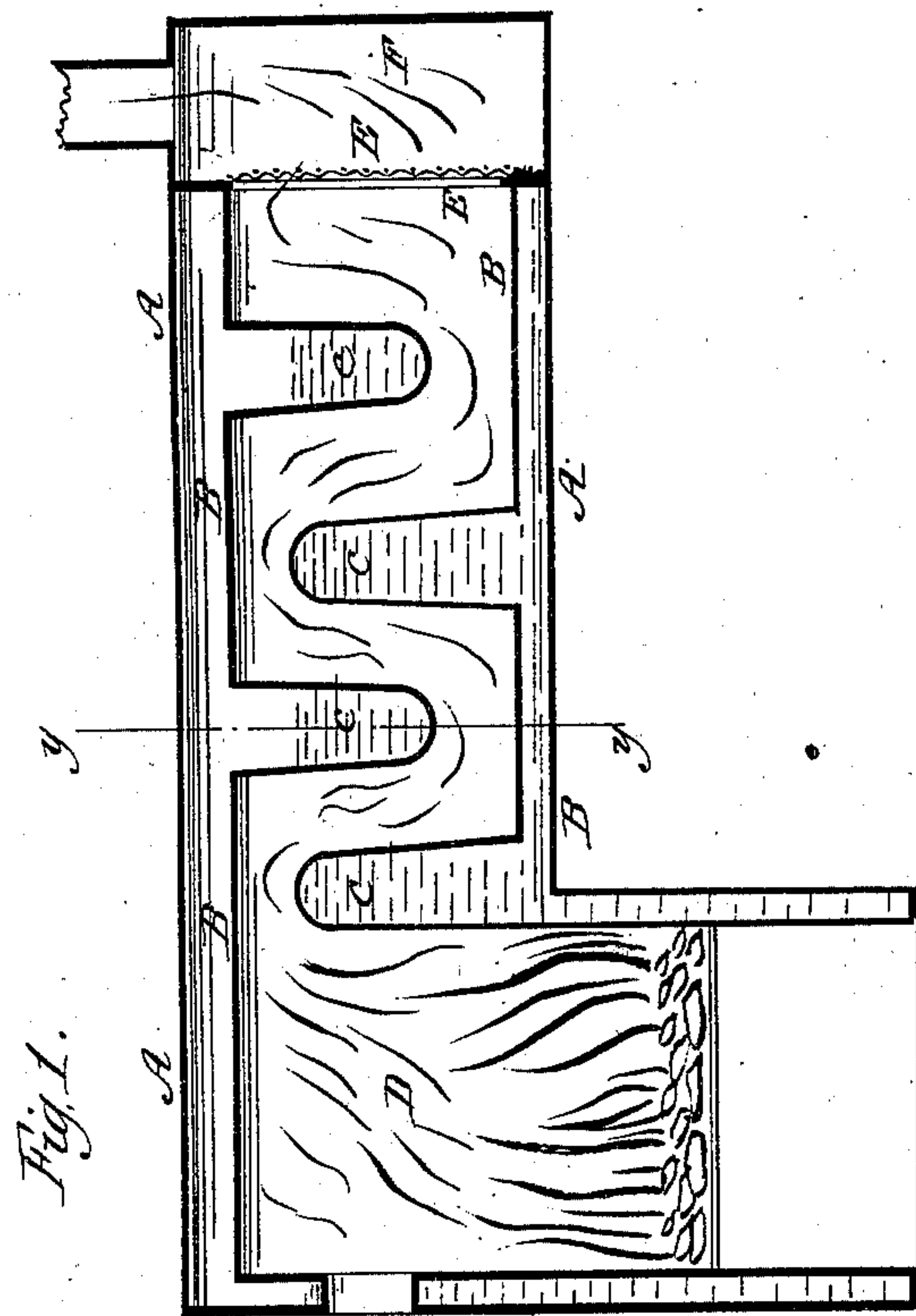
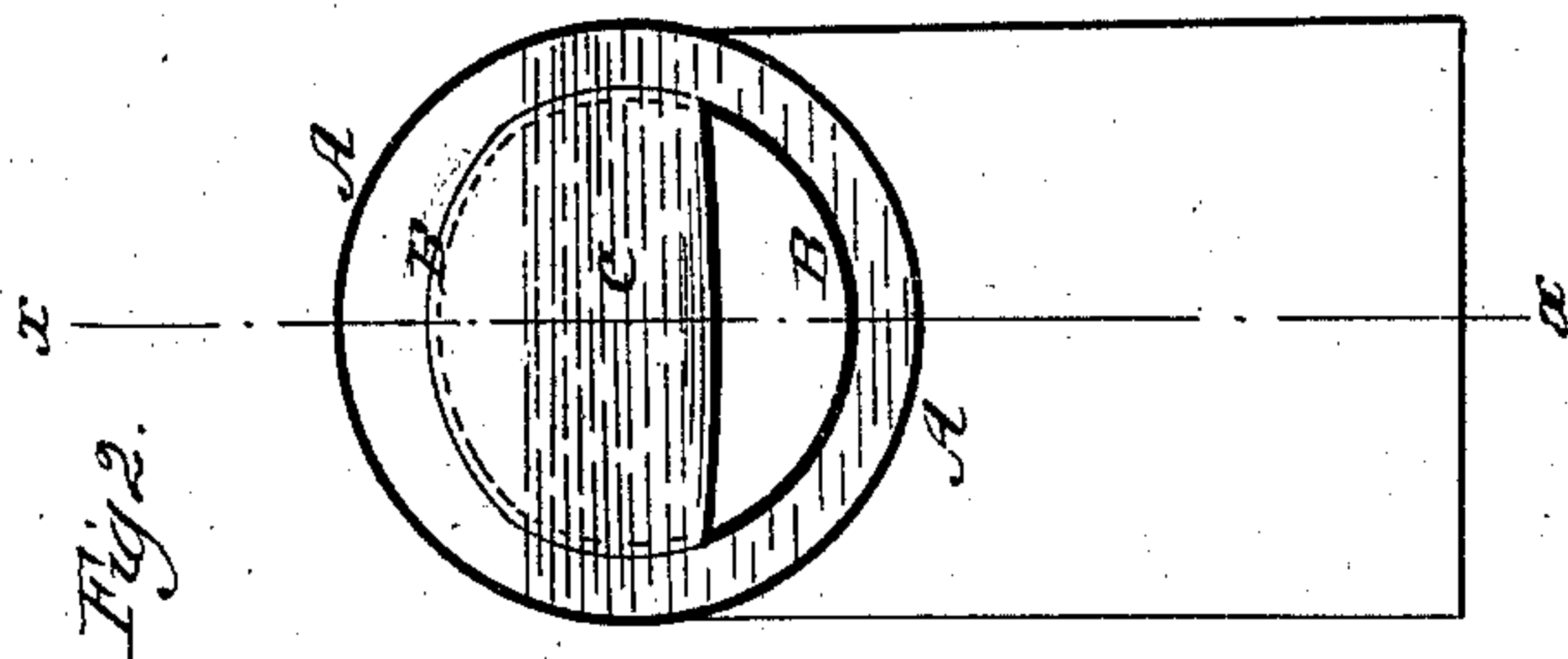


J. Kelsharr,
Steam-Boiler Fire-Box.
No 80,633. Patented Aug. 4, 1868



Witnesses.
Theo Tusch
J. A. Jackson.

Inventor.
John Kelshaw
Per Munnell
attys

United States Patent Office.

JOHN KELSHAW, OF LA FAYETTE, INDIANA.

Letters Patent No. 80,633, dated August 4, 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, JOHN KELSHAW, of La Fayette, in the county of Tippecanoe, and State of Indiana, have invented a new and useful Improvement in Locomotive or Portable Steam-Boiler; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical longitudinal section of my improved boiler, taken through the line *x x*, fig. 2.

Figure 2 is a vertical cross-section of the same, taken through the line *y y*, fig. 1.

Similar letters of reference indicate like parts.

My invention has for its object to furnish an improved boiler, stronger, safer, and more durable than the ordinary tubular boiler.

And it consists in the formation of water-chambers, projecting from the upper and lower parts of the boiler into its interior, around which chambers the fire and heat, in their passage from the fire to the smoke-chamber, are compelled to pass.

A is the outer and B the inner shell of the boiler, which are made of metal plates, riveted together in the ordinary manner. The inner shell B is placed within the outer shell A, leaving a water-space all around between them, in which position they are held and braced by stay-bolts, so as to be firmly and securely held and bound together. Chambers C are formed in the inner shell B of the boiler, extending alternately from its upper and lower sides into the interior of the said boiler, as shown in fig. 1. These chambers are formed of metal plates, the edges of which are securely riveted to the plates of the interior shell B, and they should be strengthened and braced by stay-bolts, so as to be perfectly secure. The heat and products of combustion from the fire-box D are compelled to pass around the chambers C in a zigzag direction, as shown in fig. 1. This construction exposes a very large water-surface to the action of the heat, causing a rapid formation of steam. It also does away with the long stay-bolts in use in the ordinary flue-boiler, and which are so liable to become broken, and entail great expense in repairing the boiler.

E is the spark-arrester, which is placed at the end of the interior shell B, where the flue opens into the smoke-box F. This spark-arrester is a wire screen, which prevents the escape of sparks into the smoke-box F to burn out the front parts of the boiler, and detains them within the interior shell B, where their heat may be utilized in heating the water in the boiler.

I claim as new, and desire to secure by Letters Patent—

A zigzag or undulating flue, formed by the alternately-projecting water-chambers C C, substantially as herein described.

Witnesses:

DAVID KURTZ,
PETER CLARK.

JOHN KELSHAW.