PATENTED
JAN 21 1868

Henry Gerner's Impt in Steam Boilers

73595

Fig. 1

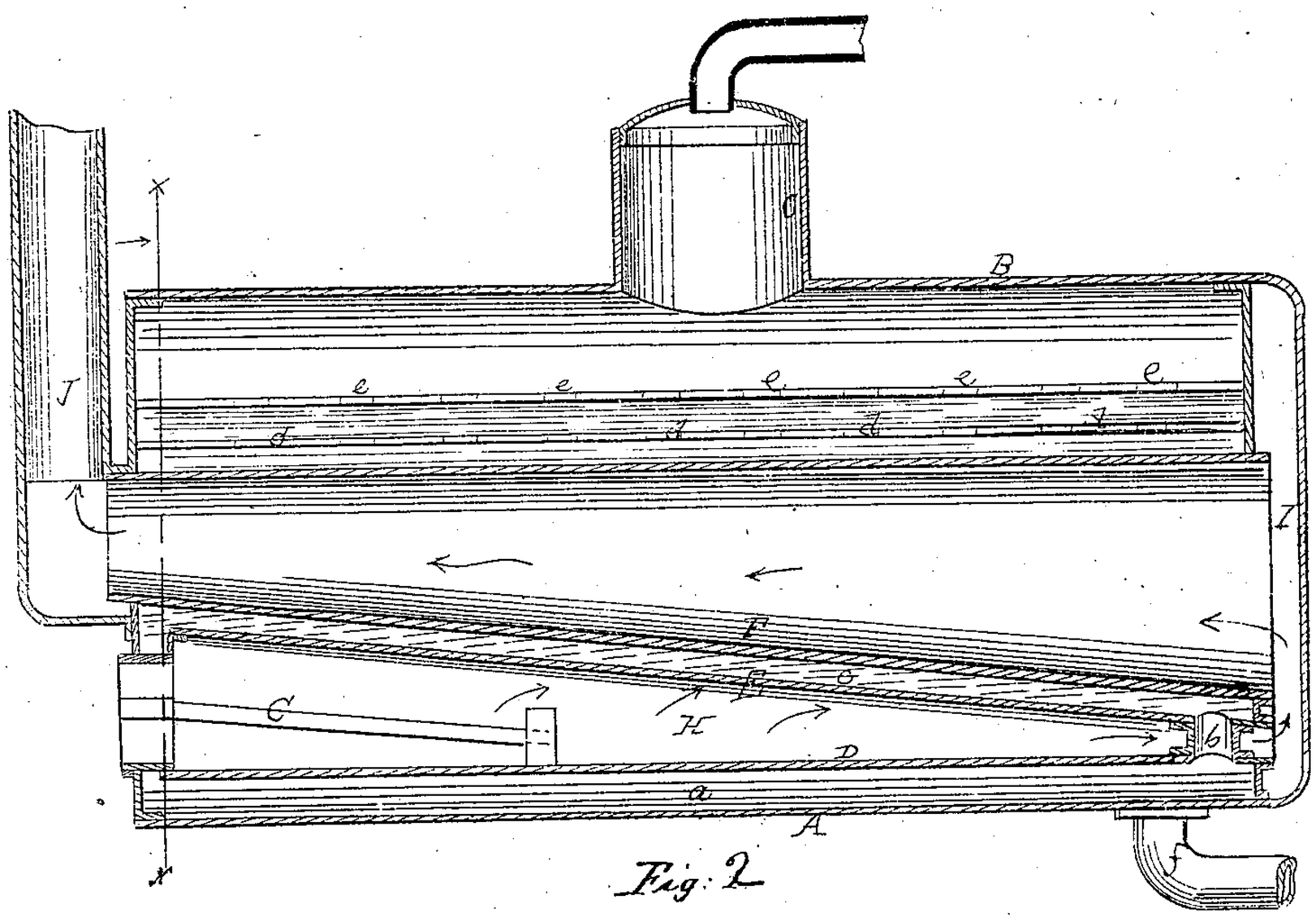
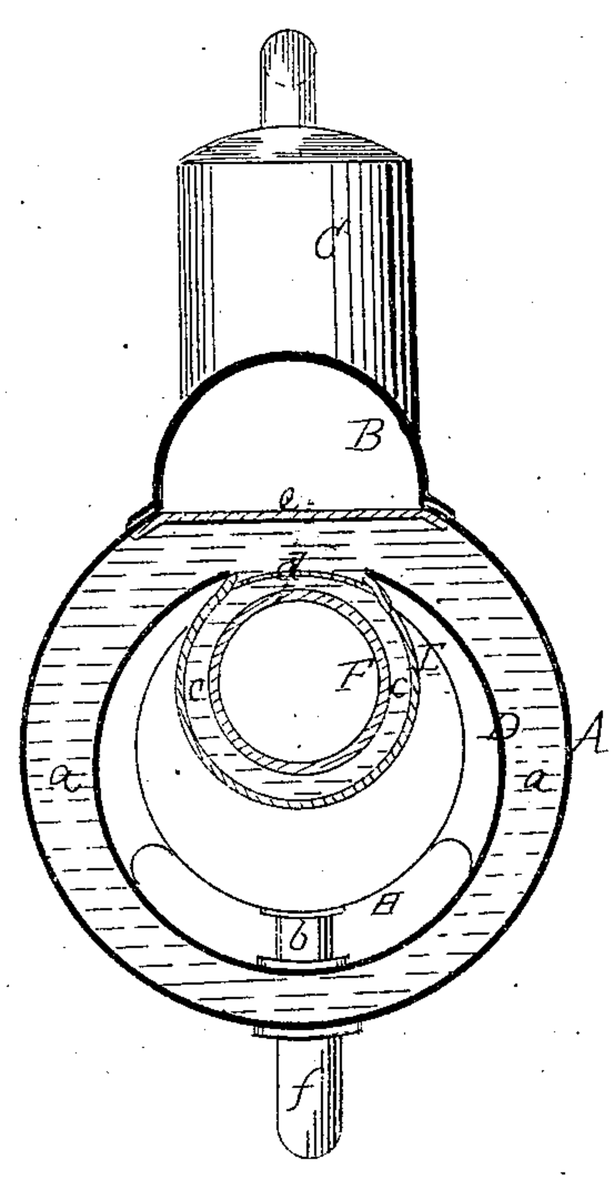


Fig. 2



Witnesses:
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per
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United States Patent Office.

HENRY GERNER, OF NEW YORK, N. Y.

Letters Patent No. 73,595, *dated January* 21, 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, HENRY GERNER, of No. 24 Broad street, New York, in the county and State of New York, have invented a new and useful Improvement in Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which drawing—

Figure 1 represents a longitudinal central section.

Figure 2 is a transverse section of the same, the line *x x*, fig. 1, indicating the plane of section, and looking in the direction of the arrow opposite to that line.

Similar letters indicate corresponding parts.

This invention relates to a steam-boiler, which consists of two cylindrical shells, one inside the other, in combination with two conical shells, secured one inside the other, and in the interior of the cylindrical shells, in such a manner that two fire-flues are obtained, one of which gradually contracts from the fireplace towards the rear end of the boiler, while the other contracts from the rear end of the boiler towards its front end, and thereby the heat is uniformly diffused throughout the boiler; and furthermore, the surface exposed to the direct action of the fire is inclined, and thereby the formation of a sediment thereon is prevented.

A represents a cylindrical shell, the upper part of which is cut away, and replaced by a semi-cylindrical drum, B, which forms the steam-space of the boiler, and which may be provided with an additional steam-dome, C. In the interior of the cylindrical shell A, and placed concentrically with the same, is a second cylindrical shell, D, the diameter of which is sufficiently smaller than that of the shell A to leave room for the water-space *a*. The upper part of the inner shell D is cut away, and replaced by a conical shell, E, which is open on top, and secured in the inside of the shell D, its large end being made to connect, by one or more tubes, *b*, with the water-space *a*. In the interior of the conical shell E is the conical flue F, the diameter of which is such that an annular water-space, *c*, is left between said flue and shell. Suitable transverse braces, *d e*, strengthen the boiler. The fire is made on the grate G, which is situated under the small end of the cones E F, and the flame passes through the flue H to the jacket I, thence back through the conical flue F, to the smoke-stack J. The upper surface of the flue H, against which the fire impinges, is inclined, so that the heating action of the fire is materially increased, and that no sediment will collect on the lower surface of the water-space *c*, and the flues H and F are contracted from opposite ends, so that the heat is equally diffused throughout the whole boiler. All the sediment which forms in the water-space *c* passes down through the tube or tubes *b*, which form the connection between the water-spaces *a* and *c*, and it can be blown off through the pipe *f*.

By these means a boiler is obtained, in which the heat is equally diffused throughout, and which provides for a free circulation of the water. The expansion and contraction of the boiler is uniform throughout, and by providing an extensive and superior heating-surface, steam can be generated with a remarkable economy of fuel.

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

A steam-boiler, having a conical flue, F, situated in a conical shell, E, which is surrounded by cylindrical shells A D, substantially as herein set forth.

Also, the combination of the conical flue F with the conical shell E, and with the grate G, substantially as and for the purposes described.

HENRY GERNER.

Witnesses:

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