A. ELVIN.

Steam-Boiler.

No. 221,044. Patented Oct. 28, 1879.

Fig: 1.

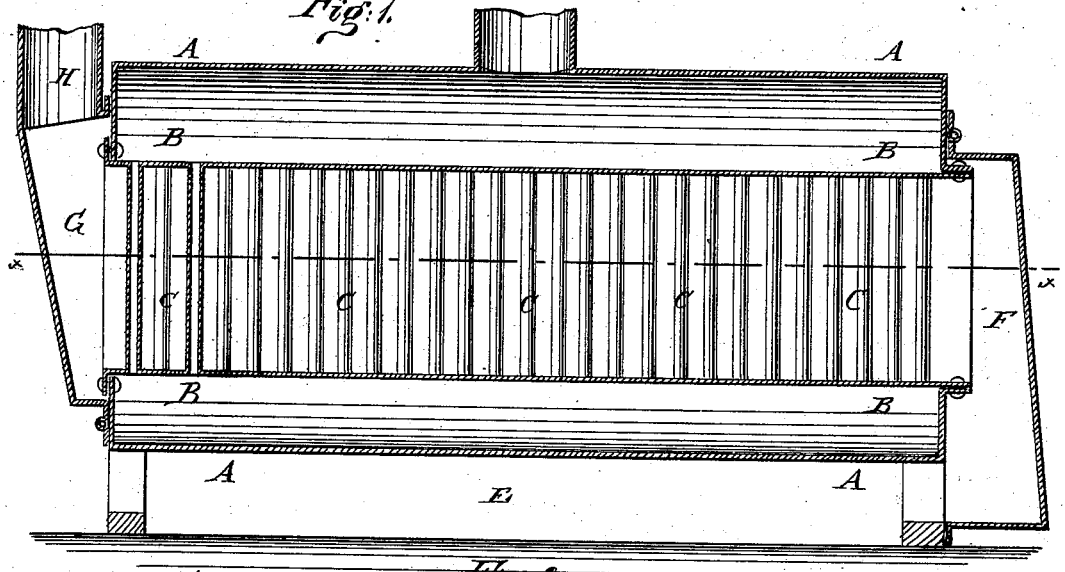


Fig: 2.

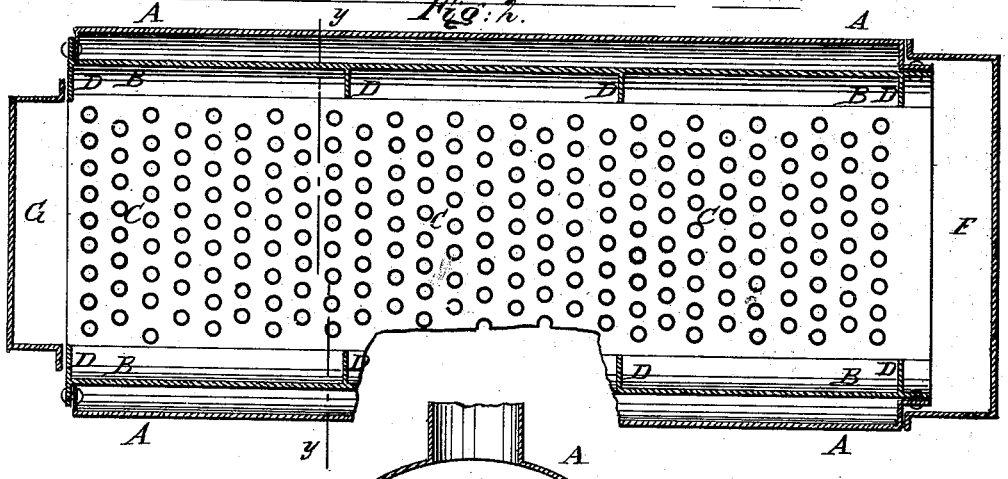
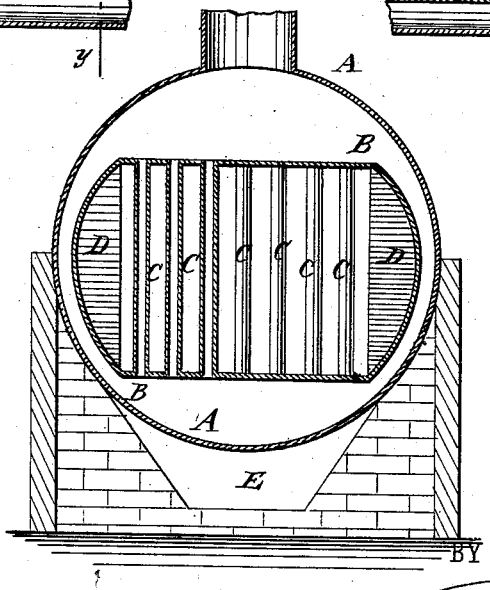


Fig: 3.



WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

ANDREW ELVIN, OF PATERSON, NEW JERSEY.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **221,044**, dated October 28, 1879; application filed July 7, 1879.

To all whom it may concern:

Be it known that I, ANDREW ELVIN, of Paterson, in the county of Passaic and State of New Jersey, have invented a new and Improved Steam-Boiler, of which the following is a specification.

Figure 1 is a vertical longitudinal section of my improved boiler. Fig. 2 is a horizontal longitudinal section of the same, taken through the line *x x*, Fig. 1. Fig. 3 is a vertical cross-section of the same, taken through the line *y y*, Fig. 2.

The object of this invention is to furnish steam-boilers which shall be so constructed that they may be easily, conveniently, and cheaply built, and easily, conveniently, and cheaply repaired, and which will secure a rapid circulation of water and a rapid and abundant generation of steam, and will cause a more perfect combustion of gases than boilers constructed in the usual way.

The invention consists in constructing a steam-boiler with a flue extending therethrough, filled with vertical tubes, and provided with braces or partitions D, the whole detachably secured into an outside shell, as hereinafter described.

A represents the outer shell of the boiler, which is made cylindrical in form. B is the inner or flue shell, which is made with a flat bottom and top and curved or cylindrical sides, as shown in Fig. 3.

The flue B is made smaller than the shell A, so as to leave a water-space all around it, as shown in Figs. 1, 2, and 3. The middle parts of the heads of the shell A are cut away to receive and fit upon the flue B.

The flue B and the heads of the shell A are provided with flanges, so that the said flue may be secured to the said shell detachably by screw-bolts or equivalent means, the joints being packed with copper or other suitable packing. The interior of the flue B is filled with vertical tubes C, the ends of which pass through and are secured in holes in the top and bottom plates of the said flue B, so that the water may circulate through the said tubes freely. The space between the said tubes C and the curved sides of the flue B is divided up into compartments by vertical bridges or partitions D, attached to the said curved sides.

The furnace E may be placed beneath the boiler, and the products of combustion may be led into the chamber F at the rear end of the boiler through the flue B into a chamber, G, at the forward end of the boiler, and thence into the smoke-stack H, or they may be led back through a flue along the top of the boiler and thence into the smoke-stack; or the furnace may be placed at the end of the boiler or in any other desired position, the only essential point being that the products of combustion must pass through the flue B, and thus come into direct contact with the tubes C.

With this construction the partitions or bridges D detain the products of combustion, cause the gases to be thoroughly consumed, and throw the products of combustion into currents and eddies, causing them to circulate around the tubes C, and thus heat the water in the said tubes very quickly, generating steam rapidly and abundantly, and causing a rapid circulation of the water.

With this construction the tubes C can be easily and conveniently inserted in the shell of the flue B, and the said flue then inserted and secured in the shell A. With this construction, also, when repairs become necessary, the flue B can be detached from the shell A, and the repairs easily and conveniently made, and the flue can then be inserted and again secured in place.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A steam-boiler whose shell B is provided with flat top and bottom, curved sides, and partitions D, as shown and described.

2. A steam-boiler whose flue B is provided with a flat top and bottom, curved sides, and partitions D, in combination with the vertical water-tubes C, as shown and described.

ANDREW ELVIN.

Witnesses:

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C. SEDGWICK.