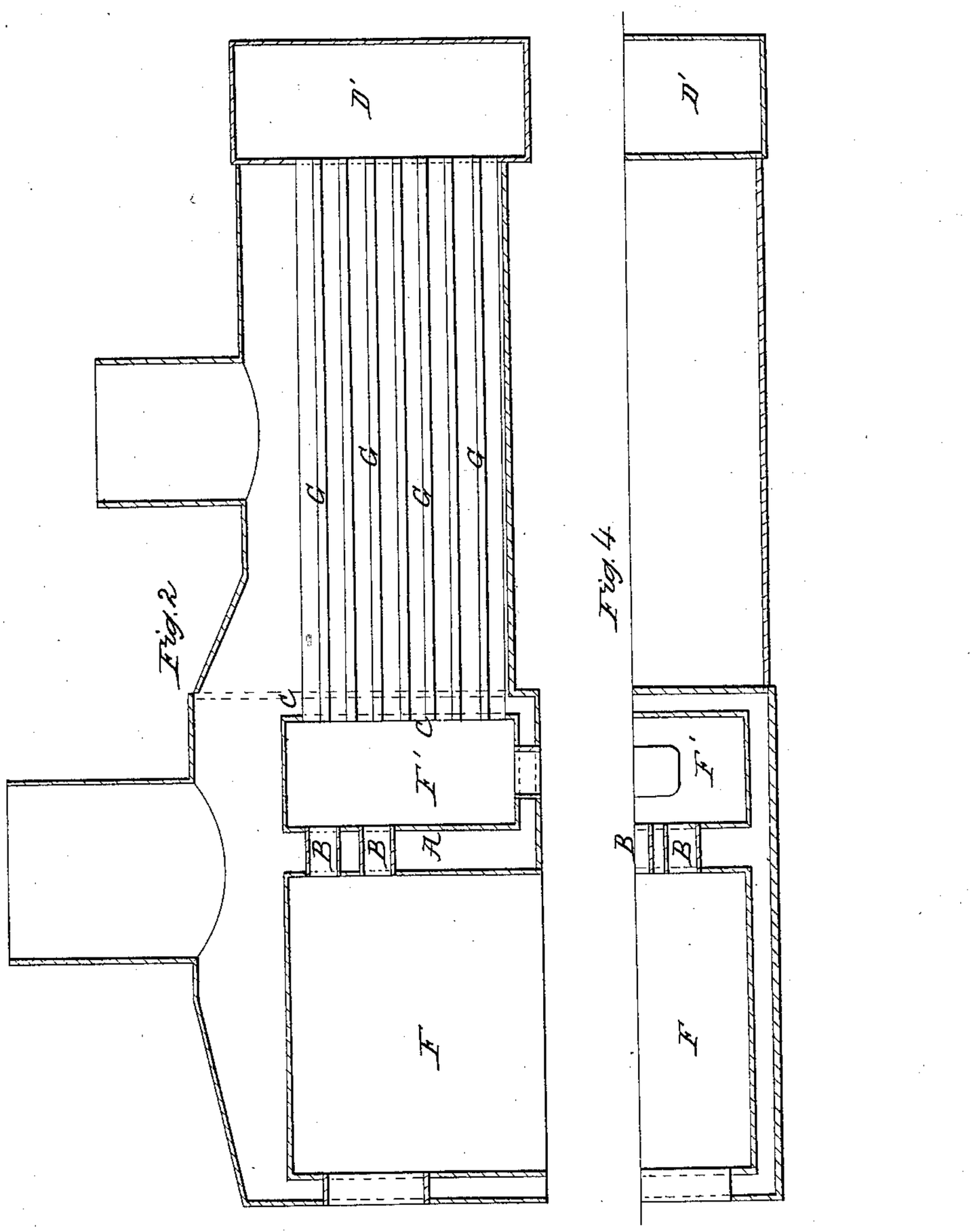
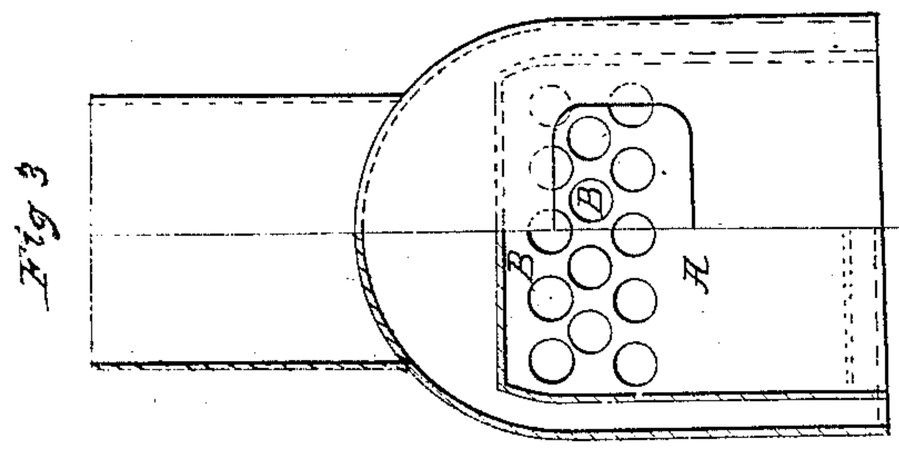
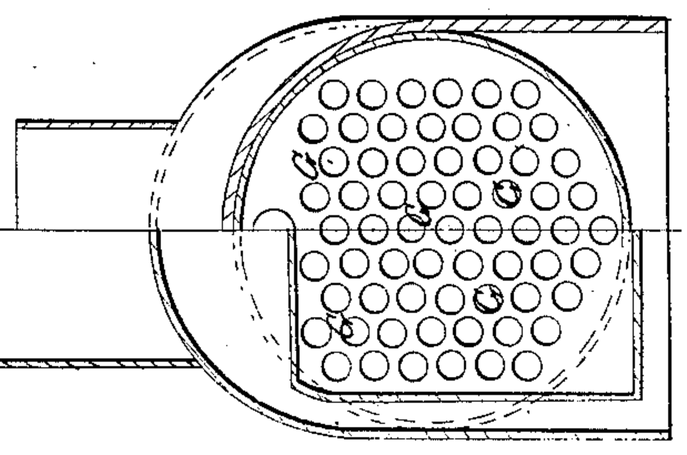
W. G. Norris,

Steam-Boiler Fire-Tube.

No. 18,467. Patented Oct. 20, 1857.







UNITED STATES PATENT OFFICE.

WILLIAM GEORGE NORRIS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **18,467**, dated October 20, 1857.

To all whom it may concern:

Be it known that I, WILLIAM GEORGE NORRIS, of Philadelphia, county of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in the Construction of Steam-Boilers; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in the intervention of a closed air-tight chamber between the fire-box and tube-sheet of the ordinary steam-boilers by means of a partition or "water-wall," connected on all sides with the water-space and perforated above the level of the fuel with tubes or flues in number and capacity sufficient to allow of a free draft, as hereinafter described.

In the accompanying drawings, Figure 1 represents a back elevation, one-half in section; Fig. 2, a longitudinal section through the center; Fig. 3, a front elevation, half in section; and Fig. 4, a sectional plan of my improved boilers.

F is the furnace, constructed in the usual way. A is the water-wall, connected on all sides with the water-space; B, the flues or perforations through which the heat passes from the fire-box. The chamber F′ is formed between the tube-sheet of the boiler and the above-mentioned perforated water-wall, and is for the purpose of effectually preventing the contact of the fuel with the tubes G terminating at the tube-sheet C, which would otherwise be burned and worn out by the constant friction of the fuel in the fire-box and by the cinders forced through the tubes by the draft, which burning and wearing is now sustained by the water-wall and its flues, which when worn out may be easily and cheaply renewed.

G are the tubes of the boiler; D^4, the smoke-chamber, the whole constructed in the ordinary manner.

I am aware that boilers have been constructed with a supplementary combustion-chamber forming part of the fire-box, having valves for the admission of the atmosphere for the purpose of more effectually consuming the gases evolved from the combustion of the furnace; but I disclaim any such arrangement, the chamber in my improvement between the fire-box and tube-sheet being closed and for the express purpose of preventing any combustion from going on in actual contact with the tubes G of the boiler, and for the purpose of reverberating, and thereby equalizing the heat before it reaches the tubes of the boilers.

Having described the construction and operation of my improvement, what I claim, and desire to secure by Letters Patent, is—

The combination, with the ordinary steam-boiler and fire-box, of a close chamber separated from the fire-box by a partition or perforated water-wall, constructed and operating as and for the purposes herein set forth.

In testimony whereof I hereunto set my hand this 26th day of August, 1857.

WM. GEO. NORRIS.

Witnesses:
EDWIN YARDLEY,
C. SNOWDEN HUNTINGTON.