F. Sulter,

Steam-Boiler Furnace

No. 79,514. Patented June 30, 1868.

Fig. 6.

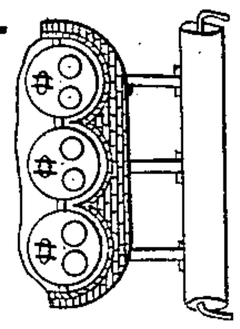


Fig. 2.

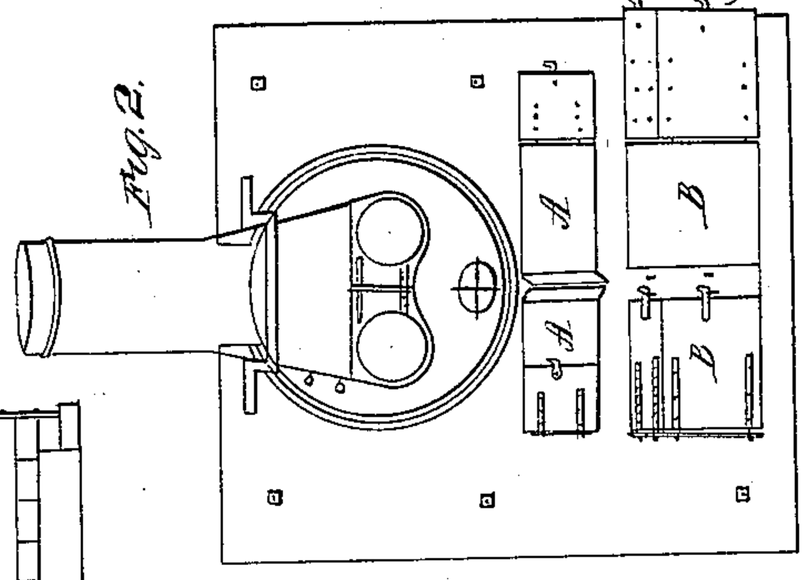


Fig. 1.

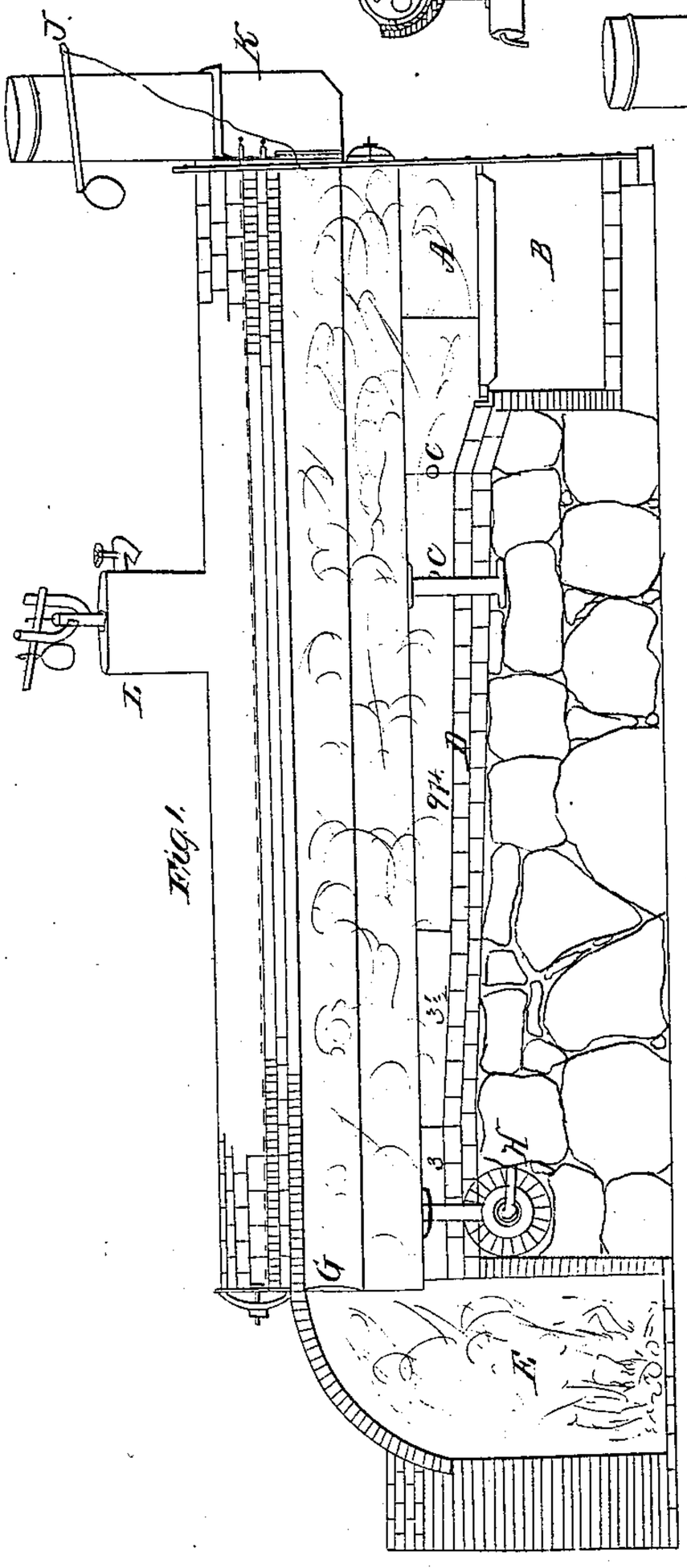


Fig. 3.

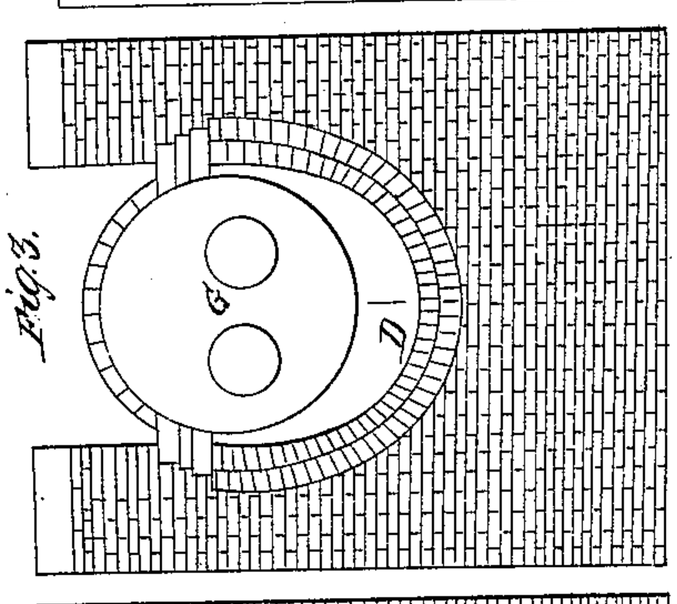


Fig. 4.

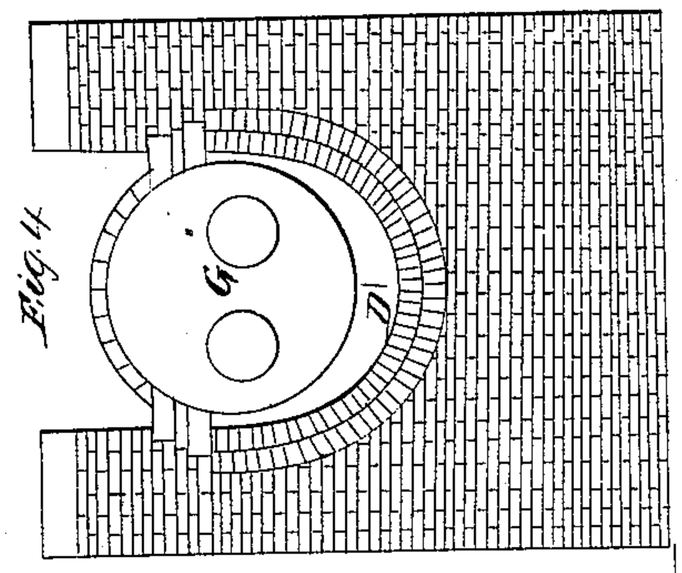
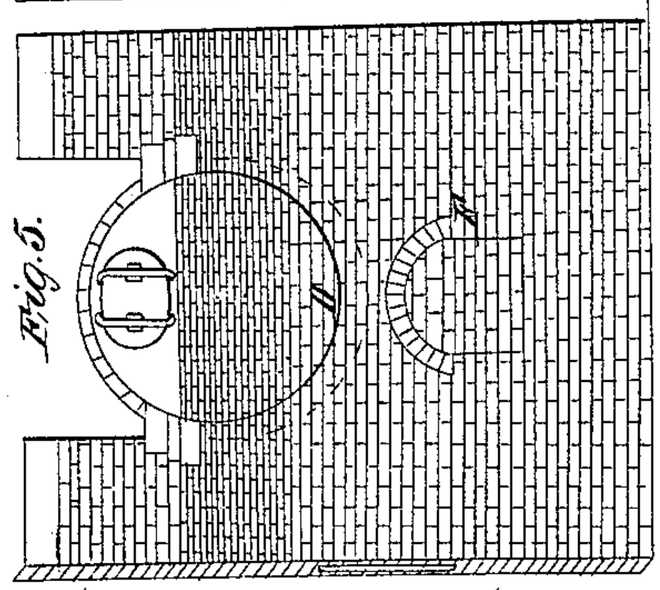


Fig. 5.



Witnesses:
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J. H. Phillips

Inventor:
Friedrich Sulter

United States Patent Office.

FREDERICK SULTER, OF ST. PAUL, MINNESOTA.

Letters Patent No. 79,514, *dated June* 30, 1868.

IMPROVEMENT IN STEAM-BOILER FURNACES.

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, FREDERICK SULTER, of St. Paul, Ramsey county, State of Minnesota, have invented an "Improved Smoke-Consuming and Fuel-Saving Heater;" and I do hereby declare the following to be an exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification, in which—

Figure 1 represents a side elevation of the heater or furnace with a boiler at top.

Figure 2, a front view of the fireplace and flue.

Figure 3 shows the mouth of the fire-hearth and boiler above.

Figure 4 shows the diminished size of the fire-hearth at the point "eight inches" below the boiler, and inclining upwards.

Figure 5 represents the rear level of the hearth, "five inches" between the hearth and boiler above, and the rear of the furnace.

Figure 6 shows how the furnace may be built with one, two, or three boilers, so as to be used as a stationary engine, a locomotive, or on steamships.

The nature of my invention consists in the construction of the furnace or heater for boilers, to be built of brick or made of iron plates, so that the hearth shall incline from the fireplace in a proper graduated inclination, with the greater inclination in front; from thence, at a regular incline, to a level near the rear, where all the smoke, sparks, and cinders are forced, retained, and consumed in a close chamber, having an air-passage at each side to receive atmospheric air that rushes into the space between the hearth and boiler, to increase the heat and assist in consuming the smoke and cinders as they pass through the chamber in the rear from the bottom of the hearth to the narrow and upper sides of the hearth, and against the lower sides of the boiler, the sparks and cinders falling down on the floor of the rear chamber.

A represents the fireplace, and B the ash-box, that are four feet five inches wide; the fireplace being eighteen inches high, and the ash-box thirty inches in depth, with ordinary close doors in front.

C C are the round air-passages, located, one on each side of the furnace, three inches in diameter, and one in front of the other, one being at the distance of six feet from the front of the furnace, and the other eight feet from the front of the furnace, viz, two feet ahead of the other. These air-passages C C extend obliquely through the walls of the furnace, the length of the passages, according to the thickness of the walls.

D is the hearth, that is seventeen feet in length, from the fireplace A to the rear spark-chamber E. The front end is at an incline from the fireplace of one and a half foot toward the rear, at six inches of a rise, being eighteen inches in front and twelve inches at the top of inclination or mouth of the furnace; from thence, where the space between the boiler and hearth is twelve inches, the hearth inclines back on a straight line for a distance of nine feet, to a point at eight inches between the boiler and hearth, the inclination being four inches, and from this eight-inch point, for a distance of three and a half feet, the hearth extends at another inclination, of three inches rise, to the point marked five inches, as the height of the boiler above the hearth. From this point the hearth is perfectly level for the distance of three feet, to the end of the hearth, where it enters the rear spark-chamber, E; the hearth, with its arch above, being oval in form, but perfectly circular below and above, on the inside; the arch covering the top of the boiler, to retain heat in the boiler, so that when the fire of the furnace is put out in the evening, the water of the boiler is kept warm until the morning, thus saving fuel; the top of the boiler having been protected from the cold air.

E is the chamber at the rear of the furnace. That is seven feet in height from its floor to the top of the arch, on the inside. It is three and a half feet long, and five feet in width. The top of this chamber is curved or half arched, from opposite the end of the hearth D to the top of the inside flues of the boiler, and the rear end of the boiler extends beyond the end of hearth two inches, so as to force the current or course of the flame, smoke, and cinders downwards, the cinders, sparks, &c., falling to the floor of the chamber E.

A door, F, is intended to be placed in the rear, so that the chamber E can be cleaned at any time required.

G represents one or more ordinary flues in a boiler.
H, the ordinary wind-pipe to clean the boiler.
J, a damper on the upright flue K, that is closed at night, so that the heat can be retained in the boiler.
The flue K is merely for the purpose of carrying off the smoke when the fire is made, and L is the ordinary valve on a boiler.

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

The construction of the inclined and horizontal surfaces of the semicircular hearth D, with its side air-passages C C, and spark and draught-chamber E, when arranged and combined as herein described and for the purposes set forth.

FREDERICK SULTER.

Witnesses:
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