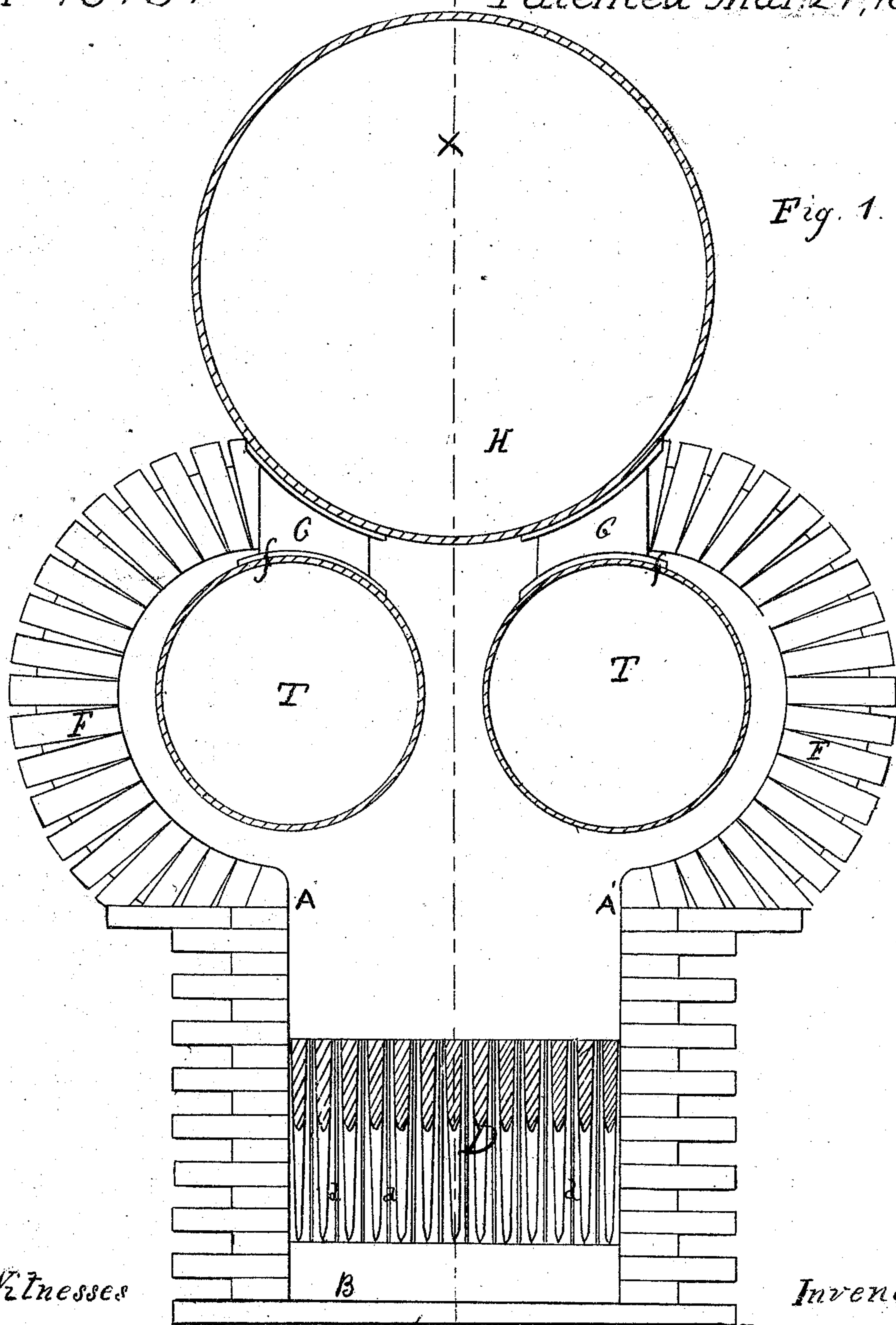


A. De Pindray
Boiler-Furnace

Nº 75739

Patented Mar. 24, 1868.



Witnesses

Inventor

Geo. T. Seymour For Alfred De Pindray
P. H. Cunningham In Richard L. L. L.
his attorney

A. De Pindray.

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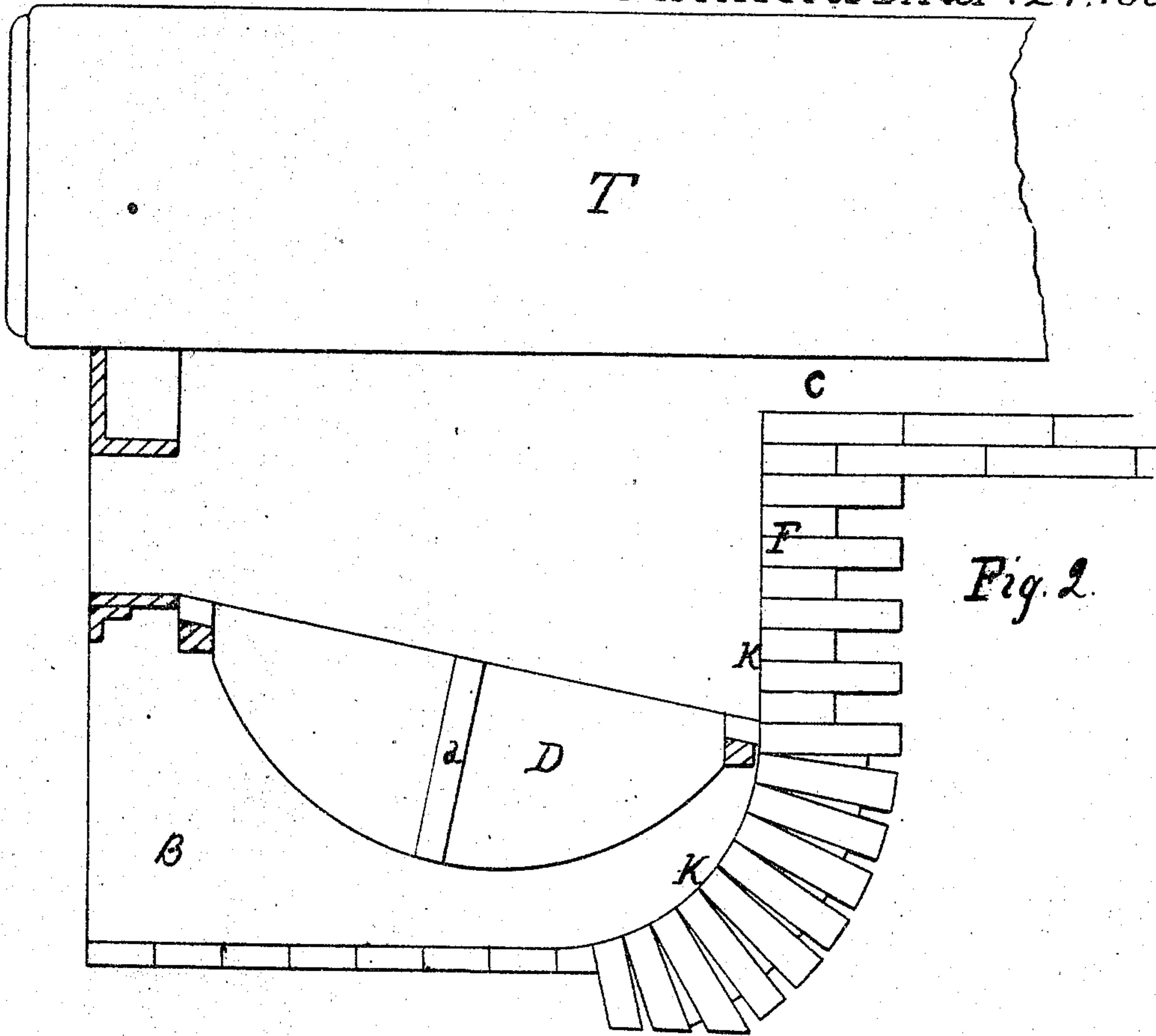


Fig. 2.

Fig. 3.

Fig. 5.

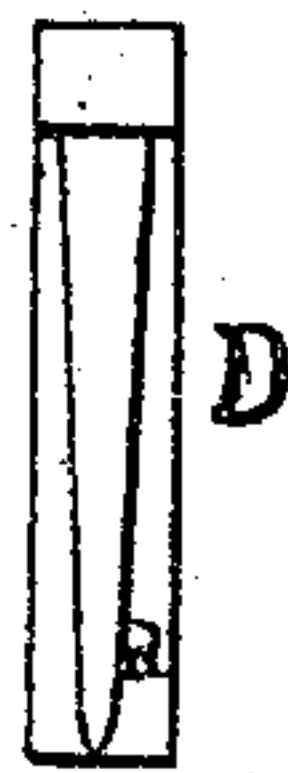
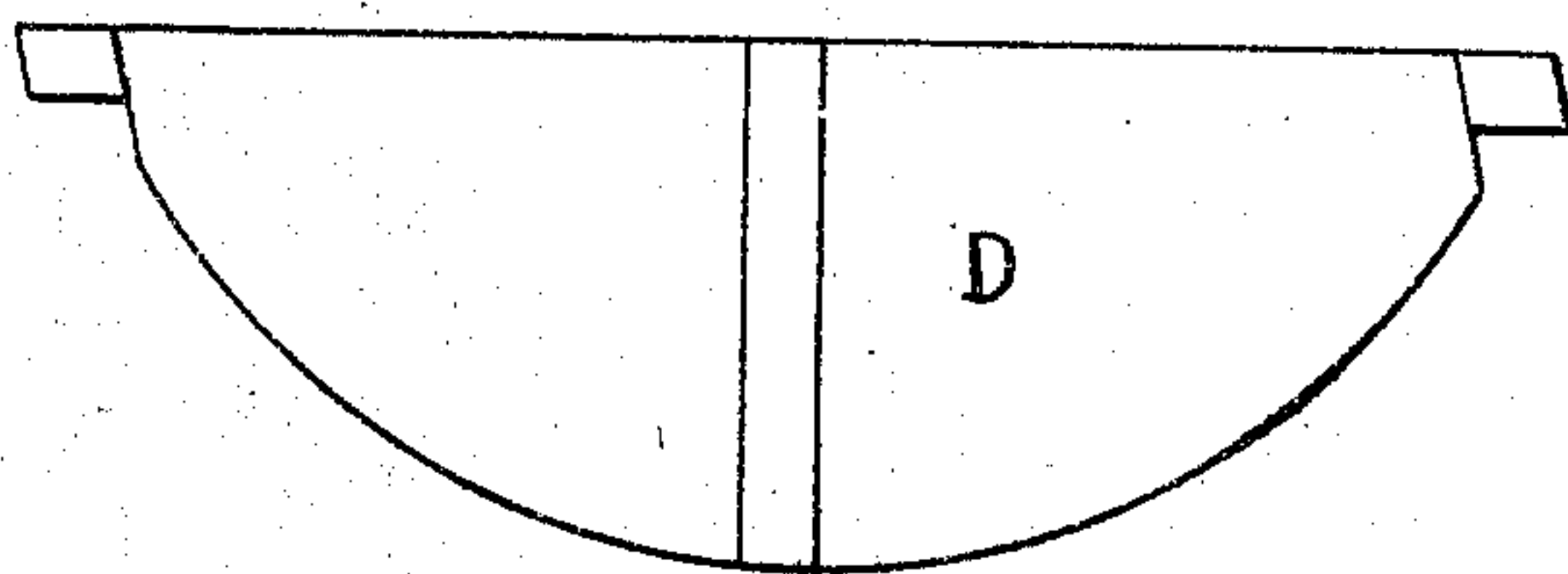


Fig. 4.



Witnesses

Geo. F. Seymour.
R. H. Cunningham

Inventor

For Alfred De Pindray
Richard Lever
his attorney

United States Patent Office.

ALFRED DE PINDRAY, OF PARIS, FRANCE.

Letters Patent No. 75,739, dated March 24, 1868.

IMPROVEMENT IN 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, ALFRED DE PINDRAY, of Paris, France, have invented a new and improved Smoke-Consuming Furnace; 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.

This invention relates to an improved smoke-consuming furnace, whereby fuel is economized and the construction of the furnace simplified.

The invention consists essentially of three parts: first, in the form and arrangement of the fire-box and furnace-walls in relation to the boiler; second, in giving an inclined concave form to the rear end of said fire-box; and, third, in the form and disposition of the fire-bars.

The boiler is disposed in the furnace in such a manner that the walls of the latter, which I prefer making of fire-brick, surround the boiler-cylinders, leaving a space of about two and three-quarter inches all around, except above, where the walls close upon the boiler-cylinders, and except below, at the ledge or floor, between which and the cylinders there should be a space of about four inches, this space being required to secure the full benefit of radiation.

The fire-box is disposed in front between the vertical walls of the furnace, the distance between said walls being less than the width of the boiler. These walls rise to within the same distance of the boiler as the curved walls, viz, about two and three-quarter inches, with which latter they connect by a shoulder. The rear end of the ash-pit connects with the floor of the bricked portion of the furnace or flue by a curved incline, whereby the return-draught, which I have found interferes greatly with the draught of the chimney in ordinary furnaces, is prevented.

My furnace-bars will be best understood by reference to the plates of drawings accompanying the specification, and are applicable to any sort of furnace.

I now proceed to describe one mode of application of my system, but am by no means to be understood as confining myself to the form of boiler now about to be described, but, on the contrary, expressly declare that my system of furnace is applicable to many kinds of boilers. In the present instance, in the accompanying plates of drawings—

Figure 1 is a vertical transverse section, and

Figure 2 a vertical longitudinal section of my improved furnace.

Figures 3, 4, and 5 are a side elevation, end view, and plan, respectively, of my improved furnace-bars.

Similar letters of reference indicate corresponding parts.

F, in the drawings, which, in the present instance, represent a boiler of two tubes, is the furnace, built by preference of fire-brick. The distance, A A', between the two vertical walls of the furnace is equal to the distance between the centres of the two tubes T. When the boiler consists of a single cylinder, the distance A A' is to be from six and a quarter to six and a half inches narrower (little more or less) than the diameter of the cylinder, the longitudinal axis whereof should lie in the central vertical plane $x x$. The vertical walls of the furnace rise from the base of the ash-pit B, till within two and three-quarter inches (little more or less) of the cylinders T. The furnace-walls then pass round the tubes, blocking them in, as seen at $f f$, except where they communicate, as at G, with any other part of the boiler, as H. This distance of two and three-quarter inches is to be observed, except where the walls close upon the tubes at f , until the lower portion or ledge C is approached, where the distance is to be increased to nearly four inches, the increase being necessary to secure the full benefit of the radiation. The ledge C joins the ash-pit by the curve K, thus preventing the return of the air, which, in ordinary furnaces, after striking against the rear wall, is thrown back, seriously interfering with the draught of the chimney. The width of the fire-box, being taken as above, and the number of horsepower given, the length of the fire-box is calculated by taking a grate-surface of nine and eighty-five hundredths inches, squared per horsepower.

The bars D, shown separately in figs. 3, 4, and 5, are fixed sloping down towards the back of the fire-bridge. This slope varies according to the length of the furnace, as shown. The rear end of the bars should be four

and three-quarter inches below the level of the front in grates fourteen inches in length, and six inches below the like level in grates of greater length. The length of the bars should be sufficient to extend from front to rear of the fire-box. They should by preference be constructed of one piece, the depth varying as follows: Bars between fourteen and twenty-two inches in length should have their greatest depth eight and three-quarter inches; for bars from twenty-two to thirty-nine inches in length, the greatest depth should be eleven and a half inches; and for bars up to five feet in length, the greatest depth should be thirteen inches. The thickness of the bars varies from seven-sixteenths to thirteen-sixteenths of an inch, the variation being dependent on the draught and consumption of fuel required. The distance between the bars will be regulated according to the fuel intended to be used. Each bar is provided with a rib or projection, *d*, on one or both of its sides.

This special form of bar, combined with the inclined curved form of the rear end of the fire-bridge, forms a sort of funnel-shaped air-channel, and directs the draught of air through the burning fuel into the lower part of the grate, producing a temperature sufficient to burn the unconsumed carbon of the smoke, and the gases arising from the fresh coal fed to the furnace.

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

1. A furnace, so constructed that the walls surround the boiler and leave spaces, in manner substantially as specified, and having the fire-box disposed between vertical walls of said furnace, and of the relative dimensions, and in manner substantially as shown and described.
2. The inclined concave wall K, connecting the floor of the ash-pit with the floor of the flue, at the rear end of the ash-pit, substantially as set forth and described.

In testimony whereof, I have signed my name to this specification before two subscribing witnesses.

ALFRED DE PINDRAY.

Witnesses:

EDWARD TUCK,
C. MARS.