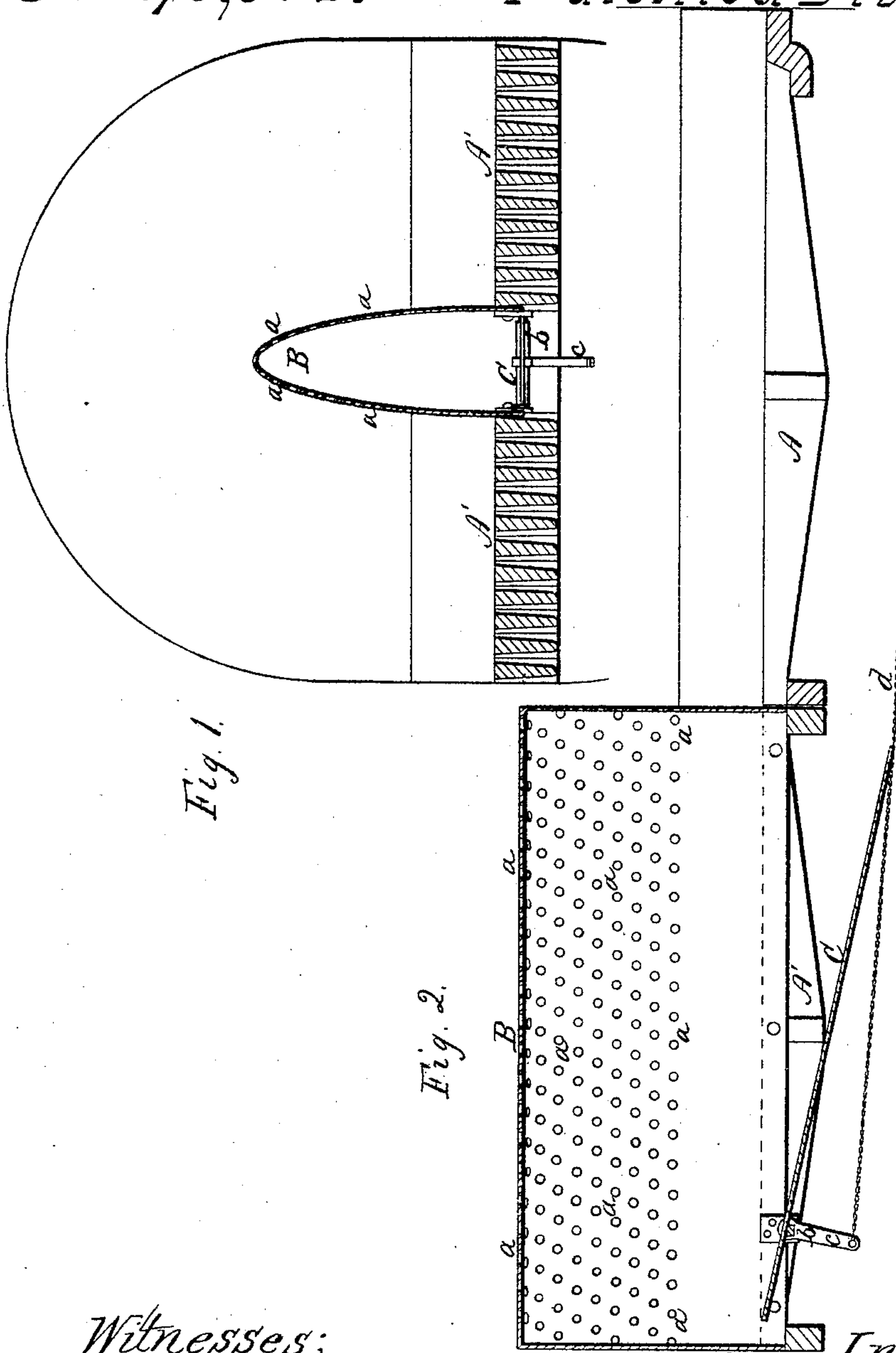


*P. Smith,
Furnace Grate.*

N^o 19,662. Patented Aug. 29, 1865.



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UNITED STATES PATENT OFFICE.

PETER SMITH, OF NEW YORK, N. Y.

IMPROVEMENT IN BOILER-FURNACES.

Specification forming part of Letters Patent No. **49,662**, dated August 29, 1865.

To all whom it may concern:

Be it known that I, PETER SMITH, of the city, county, and State of New York, have invented a new and useful Improvement in Steam-Boiler and other Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a transverse vertical section of a steam-boiler furnace with my improvement. Fig. 2 exhibits a central vertical longitudinal section of the grate and of my improvement.

Similar letters of reference indicate corresponding parts in both figures.

This invention relates to means of admitting a regulated and well-distributed supply of heated air above the fuel on the grate or fire-bed of a boiler or other furnace for the purpose of effecting the ignition of the fuliginous and combustible gaseous products eliminated from the fuel.

It consists in a novel arrangement of a regulating-valve in connection with a perforated air-distributor, through which air from the ash-pit is distributed above the fuel on the grate of the furnace.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A A' are the grate-bars of the furnace, represented as divided at the middle of the length of the grate into two series.

B is a perforated air-distributor, consisting of an open-bottomed box, of wrought-iron plate or other suitable metal or material, the transverse section of which is of the form of a semi-ellipse, an inverted letter U or V, or other substantially similar form, which takes the place of a certain number—say about four—of the grate-bars of the after or hinder series, A', which are omitted. The perforations *a a* of this distributor commence at about the level of the top of the bed of fuel, which is indicated by a red line in both figures, and are continued all over the sides, front, and top of the distributor above this level.

C is an air-regulating valve, consisting of a plate of iron fitted loosely within the open bottom of the distributor, and secured near its

rear end to a rock-shaft, *b*, which is fitted to work freely in suitable bearings in or secured to the sides of the distributor, and to which there is firmly secured a lever, *c*, to which is attached a chain, *d*, which extends forward through the ash-pit and into the stoke-hole or to the front of the furnace, where there are intended to be suitable means of securing it.

The greater weight of that portion of the valve C in front of the rock-shaft *a* as compared with that of the portion in rear of it produces a constant tendency of the valve to open itself, which tendency is counteracted by the chain *d*, connected with the lever *c*. By drawing the chain *d* forward the rock-shaft is turned in a direction to reduce the opening of the valve, and thus reduce the supply of air which is admitted from the ash-pit to the distributor, and after being heated therein distributed through its perforations above the fuel in the furnace, and by letting back the chain the valve is allowed to open itself, and thus increase the said supply of air. The valve is thus made to admit at all times a regulated supply of air above the fuel to inflame the fuliginous and combustible gaseous products eliminated from the fuel, and the regulation of this supply is at all times under the control of the engineer or fireman, so that he may, as experience directs, avoid admitting so great a quantity as to be injurious, and yet admit sufficient to effect the perfect combustion of the said fuliginous and gaseous products.

I do not claim a perforated air-distributor applied above the grate of a furnace, nor a regulating-valve applied in connection with such an air-distributor to regulate the supply of air to such distributor; but

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

The arrangement of the regulating-valve C, in connection with the air-distributor B, to open by gravitation and to be closed by a lever, *c*, and chain *d*, or its equivalent, substantially as herein specified.

PETER SMITH.

Witnesses:

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