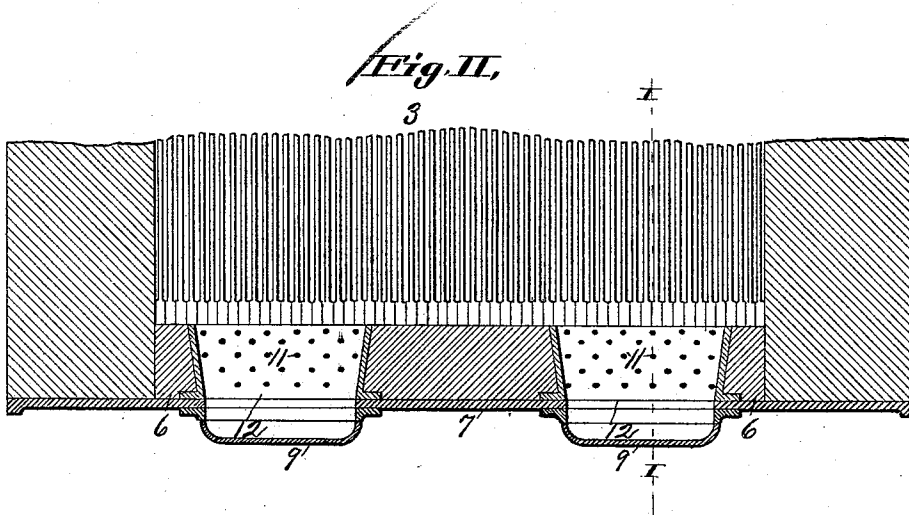
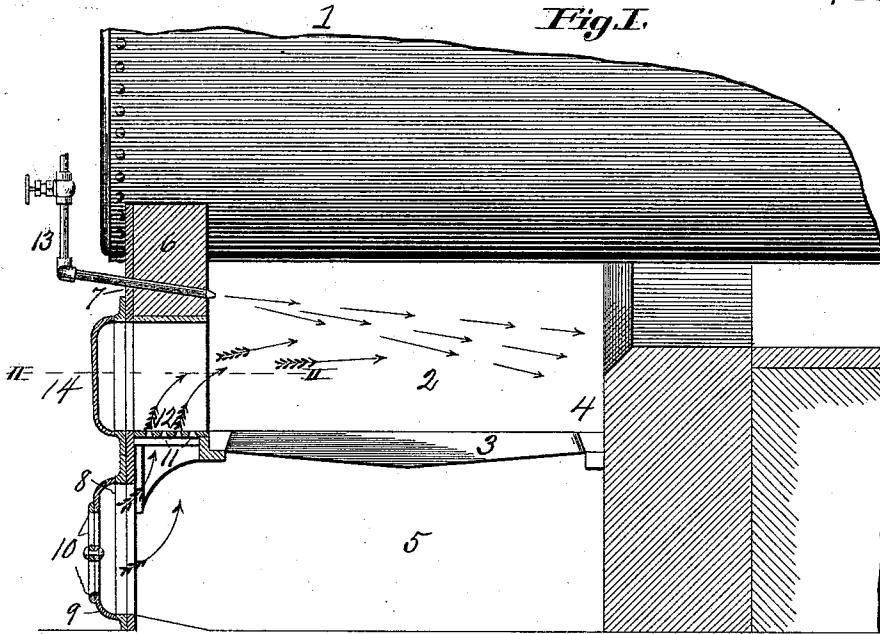


(No Model.)

J. M. WILLIAMS.  
SMOKE CONSUMING FURNACE.

No. 521,750.

Patented June 19, 1894.



*Attest;*  
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# UNITED STATES PATENT OFFICE.

JOHN M. WILLIAMS, OF ST. LOUIS, MISSOURI.

## SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 521,750, dated June 19, 1894.

Application filed March 12, 1894. Serial No. 503,286. (No model.)

### *To all whom it may concern:*

Be it known that I, JOHN M. WILLIAMS, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Smoke-Consuming Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention has for its object the improvement in smoke consuming furnaces, which consists in perforating the door-way lining between the ash pit and the fire box, forward of the grate, through which a supply of air may be continuously admitted to the fire chamber and be thoroughly heated previous to coming in contact with the boiler.

Figure I is a longitudinal section through the furnace taken on line I—I, Fig. II, and also shows a portion of a boiler in side elevation. Fig. II is a longitudinal section taken on line II—II, Fig. I.

Referring to the drawings, 1 represents a portion of a boiler, and 2 the fire box of the furnace.

3 represents the fire grate, 4 the bridge wall, and 5 the ash pit.

6 represents the front wall, and 7 the front plate of the furnace. In the front plate is formed an opening 8, which communicates with the ash pit, and which is provided with the ash pit door 9, having a regulating damper 10 through which air enters the ash pit, and flows upward and passes through perforations 11 formed in the lower side of the door-way lining 12 located between the front of the furnace and the grate bars. After passing through the perforations in the door-way lining the air enters the fire box where it mingles with a spray of steam injected from a steam supply pipe 13 which enters the fire box through the front wall of the furnace above the door-way.

14 represents a door through which fuel is introduced into the fire box.

The means which I employ for introducing air into the fire box is much more practical than it would be to admit it through the fuel door for the reason that the cold air, in the latter case, deadens the fire, and by striking the boiler cools it off, whereas by the use of my improved device, the air passes into the ash pit from where it passes up and through perforations in the door-way lining, and thence into the fire box, where it is thoroughly heated and mingled with heated steam previous to coming in contact with the boiler. The thorough mingling of the heated air and steam renders the fuel within the fire box highly combustible.

My improved device is effective, simple and durable, and may at a slight cost be applied to any furnace.

I claim as my invention—

1. In a smoke consuming furnace, the combination of a boiler, a fire box, an ash pit, a grate, an opening for admitting air into the ash pit, door-way lining and perforations in the lower side of said lining and through which air passes from the ash pit into the fire box; substantially as and for the purpose set forth.

2. In a smoke consuming furnace, the combination of a boiler, a fire box, a grate, an ash pit, door-way lining and perforations in the lower side of said lining through which air is admitted from the ash pit into the fire box, and means for injecting suitable quantities of steam into the fire box; substantially as and for the purpose set forth.

JOHN M. WILLIAMS.

In presence of—

A. M. EBERSOLE,  
C. G. EDWARDS.