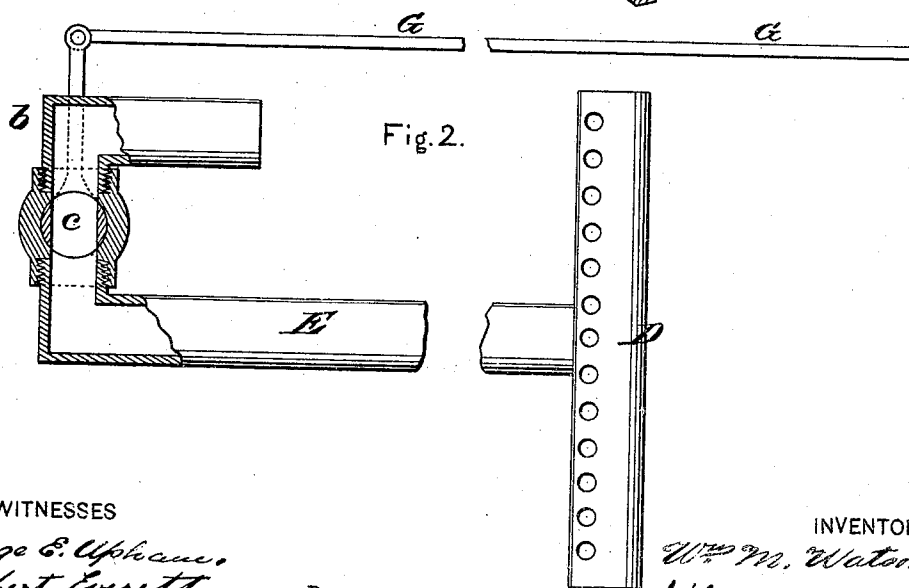
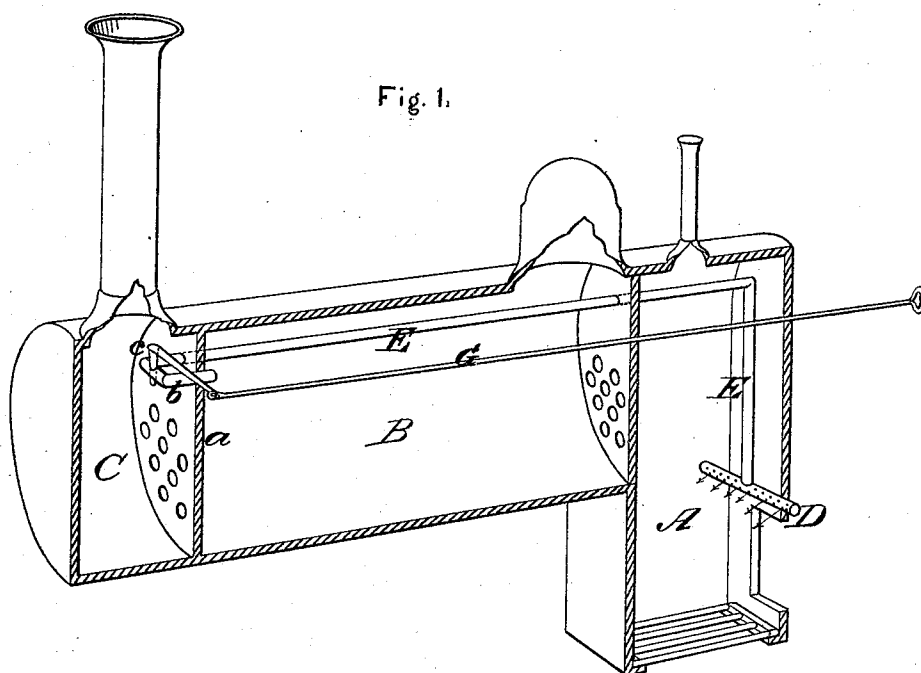


W. M. WATSON.
Furnaces.

No. 149,270.

Patented March 31, 1874.



WITNESSES

George E. Upham,
Robert Everett,

By

INVENTOR

W. M. Watson,
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ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM M. WATSON, OF TONICA, ILLINOIS.

IMPROVEMENT IN FURNACES.

Specification forming part of Letters Patent No. 149,270, dated March 31, 1874; application filed February 7, 1874.

To all whom it may concern:

Be it known that I, WILLIAM M. WATSON, of Tonica, in the county of La Salle and State of Illinois, have invented a new and valuable Improvement in Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a longitudinal section of my device. Fig. 2 is a detail view of the same.

This invention has relation to means for promoting combustion of fuel in furnaces generally, and more especially in the furnaces of locomotive-boilers. The invention consists in a novel arrangement of one or more steam-pipes communicating with and arranged in the steam-space of a steam-generator, which pipe or pipes I provide with regulating-cocks, and terminate them in the furnace by a perforated injector, which is so arranged that the steam will be introduced into the fire to the best advantage, as will be hereinafter explained.

The following is a description of my invention:

In the annexed drawing, Fig. 1, I have represented my improvement applied to a locomotive boiler and furnace; but it may be applied to steam-generators for other purposes where a free combustion of fuel is required. A designates the furnace; B, the boiler, and C the smoke-box. D designates an injector, which is thickly perforated, and suitably arranged inside of the furnace for the purpose of injecting steam into the fire.

This injector may extend across the furnace over the front door, as shown, or it may extend entirely around the furnace, and it may be of any suitable shape.

This injector has attached to it a pipe, E,

which rises to the top of the furnace, and is carried horizontally forward through the steam-space of the boiler to and through the flue-sheet *a* into the smoke-box C. In the smoke-box the pipe E is bent around and carried backward through the flue-sheet *a* again, so as to communicate with the steam-space in the boiler. In the angular portion *b* of the pipe E I apply a cock, *c*, to the lever-stem of which a rod, G, is connected, which is carried back to the engineer's station. By means of the cock *c* the engineer can regulate the amount of steam injected into the fire, or he can entirely cut off the injection.

By reason of having this angular portion, I am able to pass the rod outside of the boiler, (through that portion known as "smoke-box,") and thereby dispensing with stuffing-boxes for such rod.

The steam which is injected into the fire is "dry steam"—that is to say, it is subjected to a higher temperature than the steam in the boiler by passing through the exposed angular portion of the pipe E in the smoke-box, and also through that portion of this pipe which is exposed inside of the furnace.

I do not claim, broadly, the introduction of steam into furnaces for promoting combustion.

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

Steam-pipes communicating with and arranged in the steam-space of a steam-generator, combined with an angular bend or portion, *b*, and a perforated injector, D, said bend being provided with regulating-cock and rod, as shown and described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM MEDD WATSON.

Witnesses:

J. S. UNDERHILL,
SAMUEL UNDERHILL.