S. M. SCHINDEL.

Device for Promoting Combustion.

No. 196,708. Patented Oct. 30, 1877.

Fig. 1.

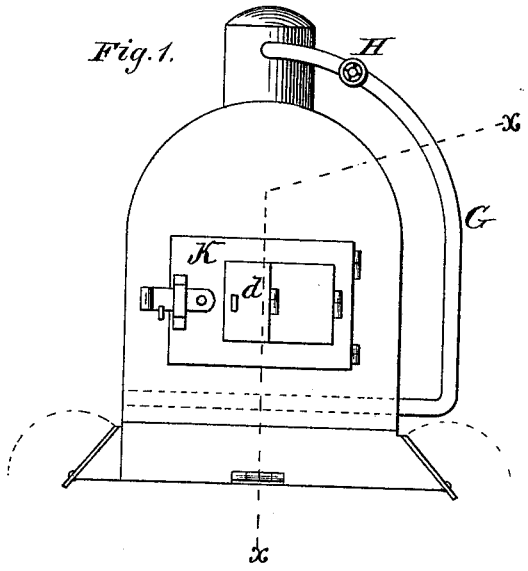
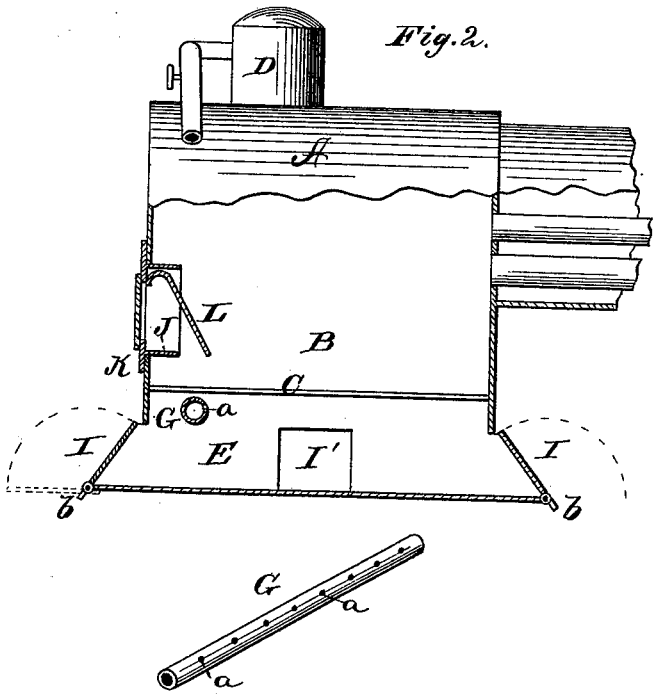


Fig. 2.



WITNESSES

Henry N. Miller

Frank Galt

INVENTOR

S. M. Schindel,

Alexander Mason

ATTORNEYS

UNITED STATES PATENT OFFICE.

S. MILFORD SCHINDEL, OF HAGERSTOWN, MARYLAND.

IMPROVEMENT IN DEVICES FOR PROMOTING COMBUSTION.

Specification forming part of Letters Patent No. **196,708**, dated October 30, 1877; application filed April 28, 1877.

To all whom it may concern:

Be it known that I, S. MILFORD SCHINDEL, of Hagerstown, in the county of Washington, and in the State of Maryland, have invented certain new and useful Improvements in Devices for Promoting Combustion; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in certain improvements upon boiler-furnaces, having for their object to burn fuel economically, consuming all the smoke, and preventing sparks from passing up the smoke-stack in locomotives, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a front view of a boiler and furnace embodying my invention. Fig. 2 is a longitudinal section of the same through the line *x x*, Fig. 1.

A represents the boiler, with furnace B, having grate C. D is the dome of the boiler, and E the ash-pan under the grate C. G is a steam-pipe leading from the dome D down to the ash-pan E, through which it passes from one side to the other immediately beneath the grate-bars. This pipe is perforated with minute holes *a* at short distances, said holes opening from the rear part of the pan forward.

H is a cock or globe-valve in the pipe G, to regulate the admission of steam into the ash-pan.

I I and I′ I′ are doors, which close up the necessary openings in the ash-pan for the extraction of the ashes. These doors are hinged to the ash-pan, open outward, and have upon their lower parts spurs or flanges *b*, which, as the door is opened, catch beneath the ash-pan and prevent the door from dropping below a horizontal line.

K is the ordinary furnace-door, to the inner side of which is bolted a short pipe or frame, J, of cast-iron or fire-clay, said pipe or frame inclosing from one-half to one-third of the area of the fire-door.

L is a deflecting-plate bolted or riveted to the upper inner surface of the frame J, and setting at an angle of from thirty to forty-five degrees. This plate has, preferably, a slight convexity at its lower corners. The furnace-door K is provided with one or more valve-doors, *d*, opening through the same into the pipe or frame J.

The furnace is operated as follows: The doors to the ash-pan being opened, the fire is built in the ordinary manner, and allowed to burn until there are fifteen or twenty pounds of steam generated, when the doors are closed, and steam is admitted by means of the globe-valve H, drawing in a small quantity of atmospheric air through the crevices of the doors, which, with the steam, not finding means of exit, passes up through the ignited coals, becoming decomposed.

The steam, parting with its oxygen to the carbon of the coal, produces hydrocarbonic-oxide gas.

Atmospheric air is now admitted through the furnace-door by means of the small valve-door *d*, which, as it rushes in, strikes the deflecting-plate L, and is spread evenly over the furnace at such an angle as to meet the steam-jets at the proper point to furnish the necessary oxygen to cause a perfect combustion of the hydrocarbonic-oxide gas and volatilized carbon.

By this means I obtain at least twice the calorific power from the fuel over the ordinary process of combustion. It is also of benefit from its perfect cleanliness, being free from soot, smoke, and sparks.

This invention can be applied to all existing boilers, and steam may be taken from the dome direct, or from the exhaust.

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

In a boiler-furnace, the combination of the angular deflecting-plate L, attached to the furnace-door for distributing air downward at an angle over the fire, and a perforated steam-pipe under the grate for supplying steam under the fire, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 3d day of April, 1877.

S. MILFORD SCHINDEL.

Witnesses:

J. C. SCHROEDER,

FRANK GALT.