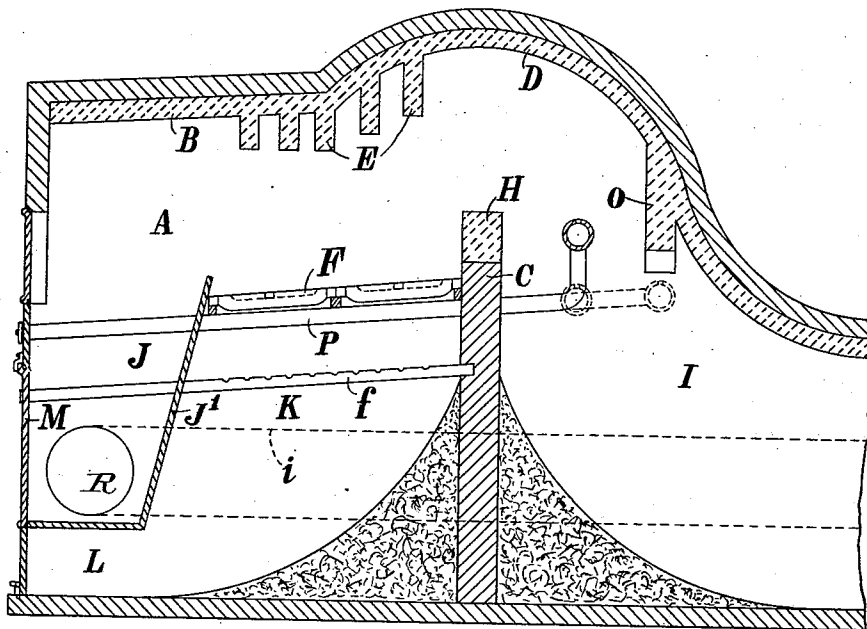


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SMOKE CONSUMING FURNACE.  
APPLICATION FILED OCT. 14, 1907.

1,008,154.

Patented Nov. 7, 1911.



Witnesses  
*W. Rader*  
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# UNITED STATES PATENT OFFICE.

THOMAS BOSTOCK HULSE, OF WINSFORD, ENGLAND.

## SMOKE-CONSUMING FURNACE.

1,008,154.

Specification of Letters Patent.

Patented Nov. 7, 1911.

Application filed October 14, 1907. Serial No. 397,381.

*To all whom it may concern:*

Be it known that I, THOMAS BOSTOCK HULSE, a subject of the King of Great Britain, residing in Winsford, in the county of Chester, in the Kingdom of England, whole-sale ironmonger's agent, have invented certain new and useful Improvements in and Connected with Smoke-Consuming Furnaces, for which application has been made in Great Britain No. 23223, dated October 19, 1906.

This invention relates to improvements in and connected with smoke-consuming furnaces, and the like, in which the smoke is not only consumed, but the calorific value of the smoke made use of.

By the present invention the furnace in which the smoke is consumed is provided with means for supplying air to and mixing it with the smoke which is passed over the firebridge, there being some such arrangement as a depending bridge or projection against which the smoke impinges in close proximity to the air supply whereby the temperature of the smoke is kept up sufficiently to cause its ignition when it comes in contact with the air. If an additional furnace be provided for the smoke, this additional furnace is provided with a similar arrangement to that above described, while means are arranged for leading the smoke to be consumed to this additional furnace and causing it to pass over or through the fire therein.

In order that the invention may be fully understood, reference will now be had to the accompanying drawing which discloses a longitudinal section of a furnace constructed in accordance with the present invention and arranged for consuming smoke in addition to that of its own fire.

In carrying out the invention as shown, the furnace A is formed with an arched roof, which for a certain portion, as shown at B, is inclined downward toward the furnace doors from a point above about the middle point of the fire bars F. The usual bridge C at the back of the fire is raised somewhat as at H. The roof of the furnace from the highest portion of the inclined portion B above referred to is curved over the bridge, the rise in the curve being equal to approximately the distance from the fire bars to the top of the extended part H of the bridge.

This curved part of the furnace, indicated by D, has depending from it as shown an inverted bridge or arch of half-moon shape indicated at O, extending somewhat below the level of the extension H. The roof of the furnace in the parts B and D has depending parts or projections E, which act as baffles.

A pipe P is led from the front of the furnace through the bridge C and terminates in the flue behind the bridge in a transverse pipe provided with suitable orifices, so that air can be supplied to the flue at this point.

J is an air-tight smoke-receiving chamber located in the ash-pit space K toward the front of the furnace and provided with a wall J'. The smoke to be consumed enters the chamber J through the mouth R of a pipe i which extends rearwardly into the furnace.

A pipe f is shown in this figure which is an alternative arrangement to the bars F when the furnace is used with gases or liquid fuel and not with coal, anthracite or the like.

L is a passage leading to the ash-pit K whereby air can be admitted.

M is a suitable furnace front.

The action of the furnace is as follows:— Unconsumed smoke enters the furnace in the compartment J from the pipe i and passes over the fire-bars F. On the fire bars there is a fire of coal or anthracite burning which consumes the smoke passing over it. Some of the smoke will impinge against the depending parts or projections E and so be caused to eddy downward more or less on to the furnace, and so be consumed. The heightening of the bridge C by means of the additional part H causes any unconsumed smoke coming in contact therewith to again eddy and be kept in proximity to the fire for a somewhat longer period and so burned. Any smoke passing over the part H will come in contact with the pipe P and the air issuing therefrom, whereby any of the smoke which has not been consumed owing to lack of oxygen in the furnace will be consumed. The depending bridge O will be found to help the combustion of this last portion of the smoke owing to its being in a practically incandescent state. The entirely consumed gases pass away by the flue I. They will naturally be at a very

high temperature and are preferably utilized in various ways as for instance the heating of water.

I declare that what I claim is:—

5 1. In a smoke-consuming furnace, the combination of a grate; a fire-bridge located at the rear of the grate; a furnace roof comprising an upwardly-inclined arched portion coextensive with the major portion of the  
10 grate, and a curved or dome-shaped portion located above the fire-bridge and extending to a point beyond the rear face of the bridge; depending projections extending into the chamber above the grate and serving to re-  
15 tain the smoke over the fire; a bridge extending downwardly from the roof in rear of the fire-bridge; a smoke-receiving chamber at the front of the grate; and means for supplying air to the flue or duct formed be-  
20 tween the bridges.

2. In a smoke-consuming furnace, the combination of a grate; a fire-bridge at the rear of the grate; a furnace roof comprising an upwardly-inclined arched portion coex-  
25 tensive with the major portion of the grate, and a curved or dome-shaped portion rising to an extent approximately equal to the height of the fire-bridge above the grate; de-  
pendent projections extending from the roof  
30 toward the grate; a second bridge or downwardly-projecting member arranged in the rear of the first bridge and against which the smoke impinges; and a transversely ex-  
35 tending pipe in the rear of the fire-bridge, and designed to supply air to complete the combustion of the smoke.

3. In a smoke-consuming furnace, the combination of a grate; a fire-bridge located at the rear of the grate; a furnace roof com-

prising an upwardly-inclined arched por- 40  
tion coextensive with the major portion of the grate, and a curved or dome-shaped portion located above the fire-bridge and ex-  
tending beyond the rear face or wall of the bridge; an ash-pit; a smoke-receiving cham- 45  
ber arranged in the ash-pit space in front of the grate; means for holding smoke to be consumed over the grate; and means for supplying air to the smoke in rear of the fire-bridge. 50

4. In a smoke-consuming furnace, the combination of a grate; a fire-bridge located at the rear of the grate; a furnace roof comprising an upwardly-inclined arched por- 55  
tion coextensive with the major part of the grate, and a curved or dome-shaped portion located above the fire-bridge and extending to a point beyond the rear face or wall of the bridge; depending projections extending from the roof into the chamber formed be- 60  
tween the roof and the grate; a second bridge or projecting member extending from the dome-shaped portion of the roof and terminating at a point behind the first-  
named fire-bridge; an ash-pit; a smoke-re- 65  
ceiving chamber located at the forward portion of the ash-pit space and in front of the grate; and a pipe for supplying air to the smoke as it passes downwardly between the bridges. 70

In witness whereof, I have hereunto signed my name this 5th day of October 1907, in the presence of two subscribing witnesses.

THOMAS BOSTOCK HULSE.

Witnesses:

H. P. SHOEBRIDGE,  
J. HAILES.