

(No Model.)

2 Sheets—Sheet 1.

G. S. RILEY.
SMOKE CONSUMING FURNACE.

No. 477,780.

Patented June 28, 1892.

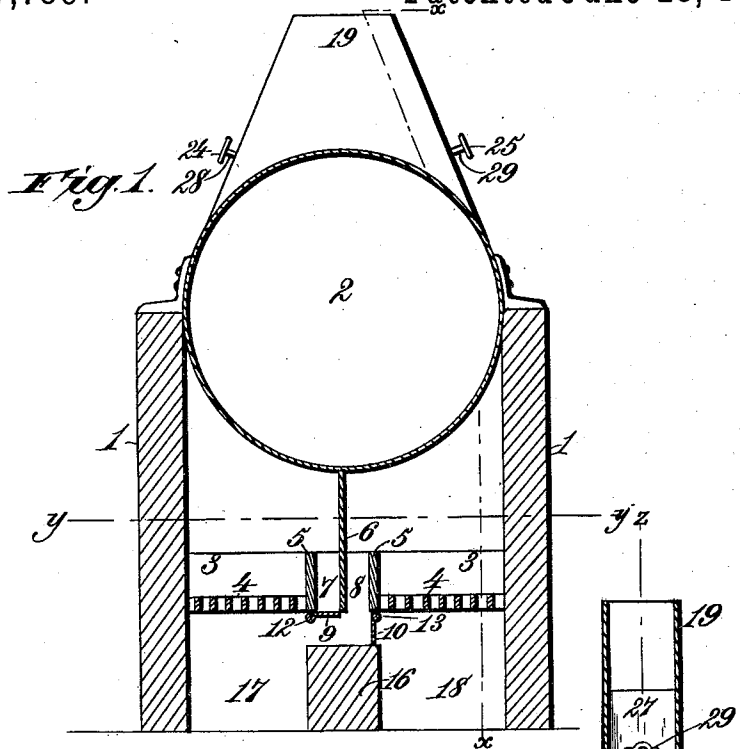
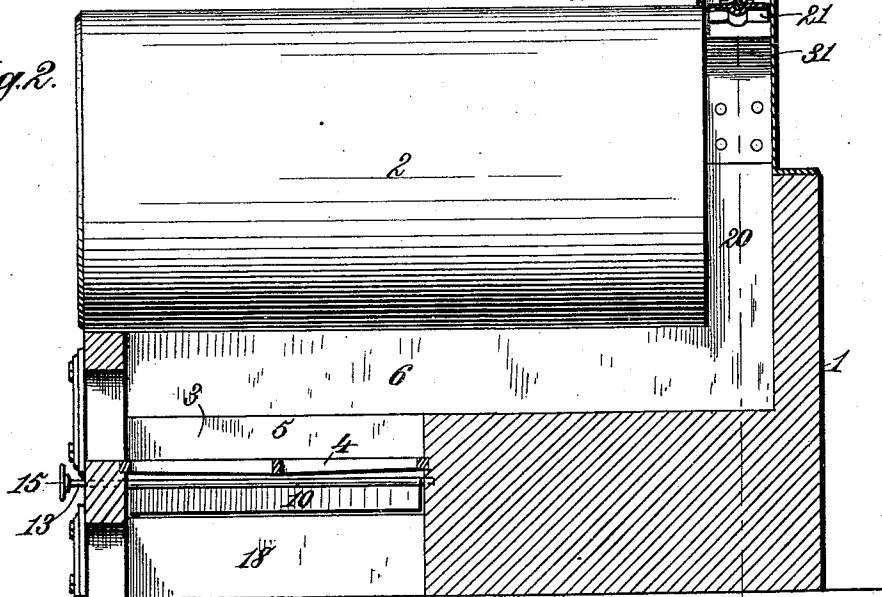


Fig. 2.



Witnesses.

Robert Emmett,

J. A. Ruthford.

Inventor.

George S. Riley.

By *Samuel L. Norris.*

Atty

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Fig. 3.

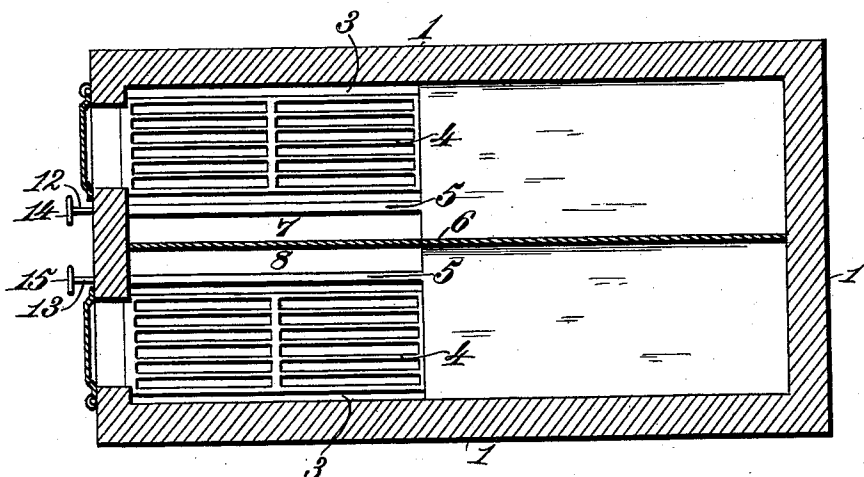
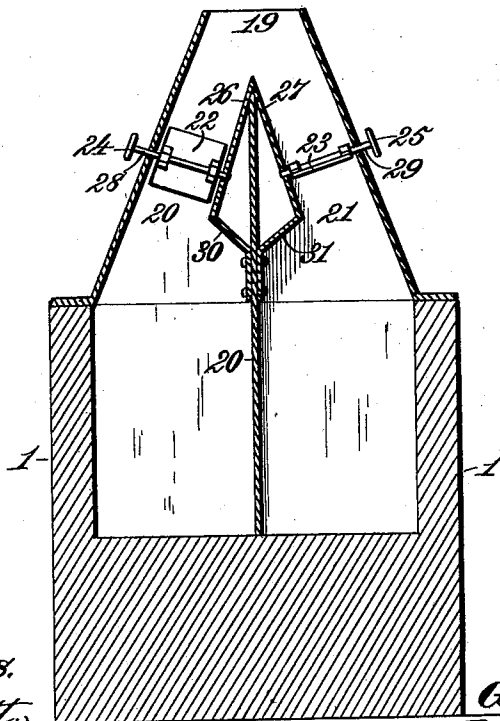


Fig. 4.



Witnesses.

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James L. Norris.

Atty.

UNITED STATES PATENT OFFICE.

GEORGE S. RILEY, OF ROCHESTER, NEW YORK.

SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 477,780, dated June 28, 1892.

Application filed October 8, 1891. Serial No. 408,189. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. RILEY, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented new and useful Improvements in Smoke-Consuming Furnaces, of which the following is a specification.

This invention has for its object to provide a new and improved boiler-furnace of that type wherein twin fireplaces located beneath the boiler are combined with valves, dampers, or gates in such manner that as one fireplace is charged with fresh fuel the smoke and other products of combustion can be caused to pass beneath the adjacent fireplace, thereby becoming aerated and rising through the incandescent fuel in transit to the chimney or smoke-stack for the purpose of effectually consuming the smoke and gases and economizing in the consumption of fuel.

The invention consists, essentially, in the combination, in a steam-boiler furnace, of twin fireplaces open at their tops and provided at their adjacent sides with vertical walls, a vertical partition extending from the boiler down between the said walls to provide opposite longitudinal flues or passage-ways, a pair of adjustable valves, dampers, or gates arranged, respectively, at or near the lower edge of the partition and below the fireplaces at the adjacent sides thereof, and a pair of adjustable valves, dampers, or gates arranged in flues in the lower portion of the smoke-stack, as will more fully hereinafter appear.

The invention also consists in other features of construction and combination or arrangement of parts hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a transverse sectional view taken in a vertical plane through the twin fireplaces. Fig. 2 is a longitudinal sectional view taken on the line *x x*, Fig. 1. Fig. 3 is a horizontal sectional view taken on the line *y y*, Fig. 1; and Fig. 4 is a vertical sectional view taken on the line *z z*, Fig. 2.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates a furnace structure comprising front, rear, and side walls of any

material suitable for the conditions required and adapted to support a steam-boiler 2 of any well-known type. The forward portion of the furnace structure is provided with twin fireplaces 3, open at their tops for the unobstructed passage of heat to the under side of the boiler. The fireplaces comprise grates 4 of any suitable construction, and the adjacent sides of the fireplaces are provided with vertical walls 5, separated from each other for the passage between the same of a vertical partition 6, which extends downward from the lower side of the boiler in such manner as to provide opposite longitudinal flues or passage-ways 7 and 8, formed, respectively, by the lower end portion of the partition and the vertical side walls of the fireplaces. The vertical partition extends longitudinally from the front to the rear wall of the furnace structure for the purpose of dividing the latter into two complete sections, and this partition may be solid or it may be hollow for the passage of air to avoid burning or warping. At or near the lower edge of the partition and beneath the fireplaces at the adjacent sides thereof is arranged a pair of adjustable valves, dampers, or gates 9 and 10, which are, as here shown, adapted to swing in the arcs of circles on rock-shafts 12 and 13, having their forward ends extended through the front wall of the furnace structure and provided with suitable handles 14 and 15 or other device for the purpose by which to turn the shafts for adjusting the valves, dampers, or gates. A longitudinal division-wall 16 divides the base of the furnace structure into a pair of ash-pits 17 and 18, and this division-wall is located directly beneath the partition 6 and flues or passages 7 and 8, so that the free edges of the valves or dampers or gates 9 and 10 can be brought to rest against the upper end portion of the partition-wall.

A smoke-stack 19 is arranged at one end of the furnace structure and its lower portion or swell contains a vertical partition 20, which constitutes a continuation of the longitudinal partition 6 for the purpose of dividing the lower portion of the smoke-stack into two corresponding flues 20 and 21. The pair of valves, dampers, or gates 22 and 23 are arranged, respectively, in the flues 20 and 21, and at their

outer ends are provided with suitable handles 24 and 25 or other devices by which to adjust them into the position required. The smoke-stack is tapering at its base portion, and in order to provide the proper square or other properly-shaped orifices for the arrangement of the valves, dampers, or gates 22 and 23 I construct the upper portion of the partition 20 with divergent walls 26 and 27, in which are journaled the inner extremities of the shafts 28 and 29 of the valves, dampers, or gates 22 and 23, which may be square, circular, or other convenient shape. The lower extremities of the divergent walls 26 and 27 are joined to the partition 20 by converging walls 30 and 31, thereby providing the upper end portion of the partition 20 with a wedge-shaped enlargement for the purpose of providing the proper spaces to receive the valves, dampers, or gates, and also affording supports for the shafts which carry such valves, dampers, or gates.

In the drawings I have exhibited the smoke-stack as located at the rear of the furnace structure; but if the boiler is provided with return-flues in the usual manner the smoke-stack will accordingly be located at the front of the furnace structure in a manner which will be obvious to those skilled in the art, for which reason I do not deem it essential to illustrate this arrangement in the drawings.

In the practical operation of the furnace, if the damper or gate 10 is adjusted to a vertical position and rests against the partition-wall 16, and the valve, damper, or gate 23 in the smoke-stack is closed, while the damper 9 is horizontal and the damper 22 is open, the smoke and other products of combustion from the fireplace 3 will descend through the flue or passage-way 8 to a point beneath the adjacent fireplace and becoming aerated rise through the incandescent fuel therein, by which means the smoke and gases from the freshly-charged fireplace are effectually consumed by passing through the incandescent flue in the adjacent fireplace. Obviously if the damper or gate 9 be vertical, the damper 22 closed, the damper 10 horizontal, and the

damper 23 open the reverse action will occur. By this means as one fireplace is charged with fresh fuel the smoke and other products of combustion therefrom can be caused to pass beneath the adjacent fireplace, there becoming charged with oxygen, and rise through the incandescent fuel in transit to the chimney or smoke-stack for the purpose of effectually consuming the smoke and gases.

My invention provides a simple, economical, and efficient construction which fulfills all the conditions required to consume the smoke in a steam-boiler furnace.

Having thus described my invention, what I claim is—

1. The combination, in a steam-boiler furnace, of twin fireplaces open at their tops and provided at their adjacent sides with vertical walls, a vertical partition extending from the boiler down between the said vertical walls to provide opposite longitudinal flues or passage-ways 7 and 8, and a pair of adjustable valves, dampers, or gates arranged, respectively, below the twin fireplaces at the adjacent sides thereof, substantially as described.

2. The combination, in a steam-boiler furnace, of twin fireplaces open at their tops and provided at their adjacent sides with vertical walls, a vertical partition extending from the boiler down between the said vertical walls to provide opposite longitudinal flues or passage-ways 7 and 8, a pair of adjustable valves, dampers, or gates arranged, respectively, below the fireplaces at the adjacent sides thereof, a smoke-stack containing a partition which forms a continuation of the partition beneath the boiler for dividing a portion of the smoke-stack into two flues, and a pair of adjustable valves, dampers, or gates arranged, respectively, in the said flues, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

GEO. S. RILEY. [L. s.]

Witnesses:

WM. C. LOWREY,
WM. H. FARRAND.