

**Specification of John Clay : apparatus for consuming smoke in furnaces, &c.;**

**Contributors**

Clay, John.

**Publication/Creation**

London : Queen's Printing Office, 1854 (London : George E. Eyre and William Spottiswoode)

**Persistent URL**

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A.D. 1845



N<sup>o</sup> 10,491.

S P E C I F I C A T I O N

OF

JOHN CLAY,

APPARATUS FOR CONSUMING SMOKE IN  
FURNACES, &c.

LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,  
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY:

PUBLISHED AT THE QUEEN'S PRINTING OFFICE, EAST HARDING STREET,  
NEAR FLEET STREET.

*Price 9d.*

1854.





A.D. 1845 . . . . . N° 10,491.

**Apparatus for Consuming Smoke in Furnaces, &c.**

**CLAY'S SPECIFICATION.**

**TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JOHN CLAY,** of Edgely, Cheshire, Corn Dealer, send greeting.

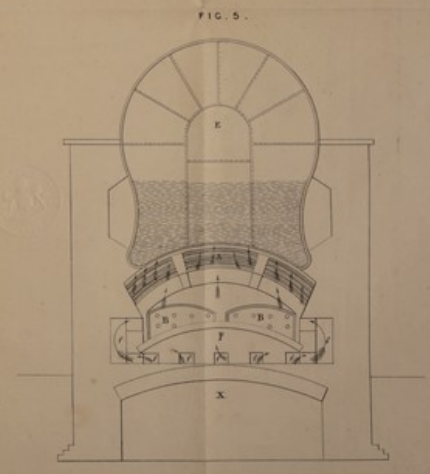
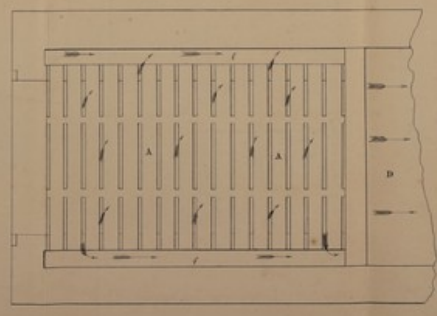
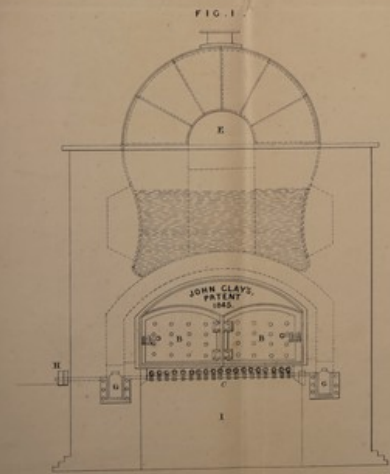
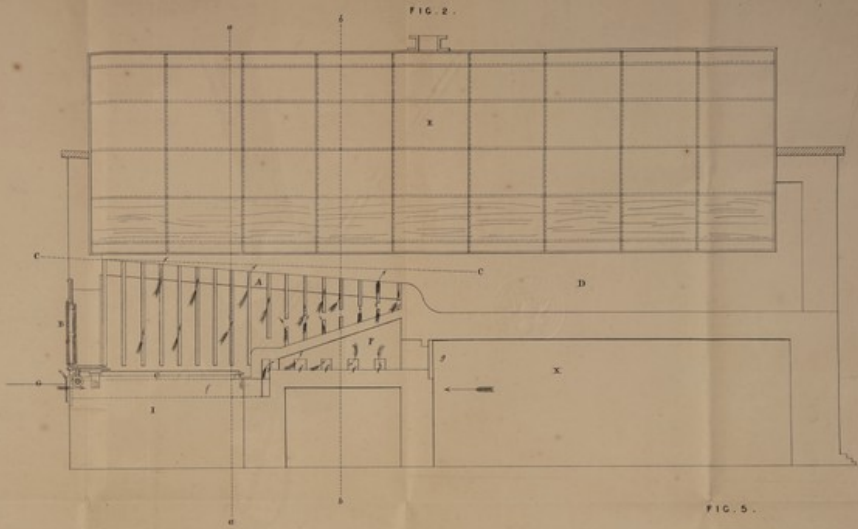
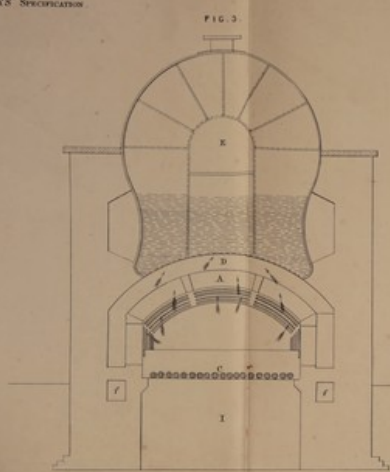
**WHEREAS** Her present most Excellent Majesty Queen Victoria, by Her Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Twenty-third day of January, in the eighth year of Her reign, and in the year of our Lord One thousand eight hundred and forty-five, did, for Herself, Her heirs and successors, give and grant unto me, the said John Clay, Her especial licence, full power, sole privilege and authority, that I, the said John Clay, my eñors, adñiors, and assigns, and such others as I, the said  
10 John Clay, my eñors, adñiors, and assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England and Wales, and the Town of Berwick upon Tweed, my Invention of "**AN IMPROVED APPARATUS FOR CONSUMING SMOKE;**" in which said  
15 Letters Patent is contained a proviso that I, the said John Clay, shall cause a particular description of the nature of my said Invention, and in what manner the same is to be performed, to be enrolled in Her Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in part recited Letters Patent, as in and by the same, reference being  
20 thereunto had, will more fully and at large appear.

*Clay's Improved Apparatus for Consuming Smoke.*

NOW KNOW YE, that in compliance with the said proviso, I, the said John Clay, do hereby declare the nature of my Invention of an Improved Apparatus for Consuming Smoke to consist in a certain new construction and arrangement of the furnace in which the fuel is placed for the purpose of generating heat, and the manner in which such Invention is to be performed 5 and carried into effect will be seen by reference to the annexed Drawing, and the following description thereof:—

## DESCRIPTION OF THE DRAWINGS.

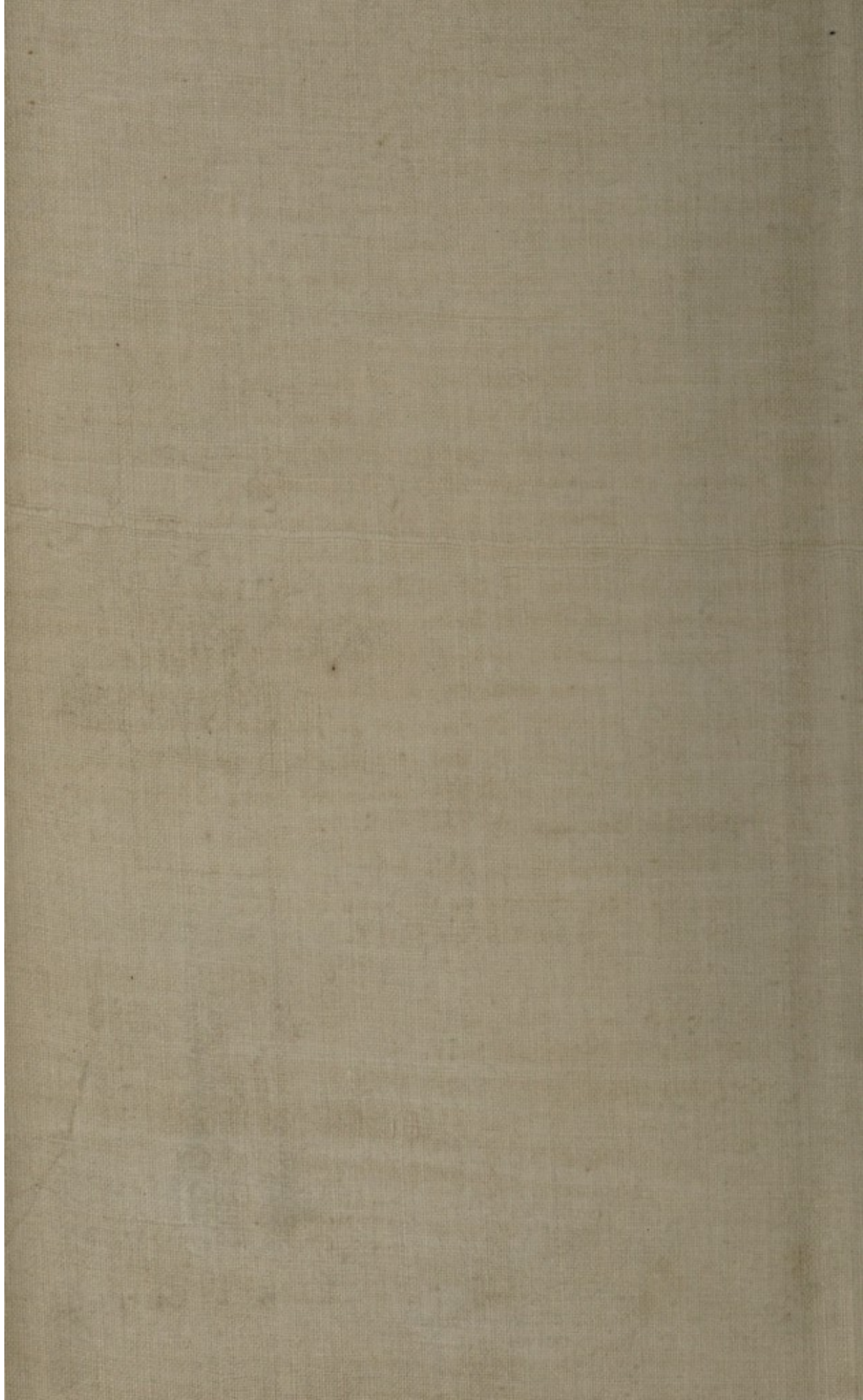
The scale to which the Drawings are made is marked thereon, and the same figures and letters of reference indicate the same parts in the various 10 views and section represented in the Drawing. Figure 1 represents a front view of the furnace as applied to a steam boiler, the position of the flues being dotted in; Figure 2 is a longitudinal section of the same; and Figure 3, a transverse section taken on the line represented at *a, a*, Figure 2. In Figures 2 and 3, A represents an arch placed immediately above the furnace, and 15 Figure 4 represents a sectional plan taken immediately above this arch A at the line *c, c*; see Figure 2. Figure 5 is a second transverse section taken at the line *b, b*, Figure 2, as seen from the arrow *x*. In Figures 1 and 2, B, B, represent the doors of the furnace, which are formed with a double casing, and perforated with holes for the admission of air. C are the fire bars. D is the 20 flue, passing under the boiler E in the ordinary manner; and I is the ash pit; above the furnace and immediately beneath the boiler E is formed an arch of fire brick A, which is provided with a series of openings for the free passage of the smoke, heated air, and flame to the bottom of the boiler, as best seen at Figures 2 and 4, the direction of which is indicated by small arrows. The 25 crown of the arch A has a regular inclination, so as to recede from the bottom of the boiler; as it recedes from the front of the furnace, and at the opposite end from the front of the furnace, is formed the chamber F, to which air can be admitted occasionally by the flues *f, f*, which are opened or closed by the sliding doors G, as seen at Figures 1 and 2; at the back of this chamber F is 30 placed the door *g*, which can be opened when required for cleaning out the chamber, and the course of the air from the chamber F to the inner surface of the arch A is indicated by small arrows, as seen at Figures 2 and 5, but this course of the heated air may be varied by forming openings in the arch, as represented in red lines at Figure 2. The fire bars C are supported at each 35 end, the nearest end of each bar being provided with a worm pinion, which receives motion from the worms placed on a transverse shaft driven by a strap passing over the pulley H, as seen at Figure 1. By this arrangement each



The enrolled drawing is partly colored.

London: Printed by George Ewbank Elgar, and William Sturgeson.  
 Printers to the Queen and Earl Marshal. 1845.

Math. 244.25.



*Clay's Improved Apparatus for Consuming Smoke.*

bar partakes of a slow revolution, and prevents the fire becoming dull in any particular part, or clinkers forming to impede the free current of air to the ignited fuel. In the foregoing description it will be seen that the whole of the smoke and gases generated by the combustion of the fuel in the furnace must  
5 pass through the small openings in the heated arch A, instead of passing from the furnace in a large volume, as in ordinary furnaces. This wire drawing or passing the smoke through the contracted openings in the heated arch consumes the carbonaceous portion of such smoke, which consumption is also accelerated when required by the admission of heated air from the chamber F. Thus the  
10 temperature of the furnace is maintained, and the gases evolved after the carbonaceous portion of the smoke is consumed at the arch A proceeds by the flue D under the boiler and to the chimney in the ordinary manner.

Having now described the nature of my Invention of "An Improved Apparatus for Consuming Smoke," together with the manner in which the same may  
15 be performed and carried into effect, I do not confine my claim of Invention to the exact arrangement set forth and described in the annexed Drawings; but I do claim all modifications of such Invention, the characteristic of such consisting in the passing of the smoke and gases evolved from the furnace through a contracted space of heated surface placed between the furnace, and  
20 the surface to be heated, with or without the admission of air, as already described; and I further claim the continuous or occasional revolutions of the fire bars, as also described, all which are to the best of my knowledge new, and never before practised in that part of Her Majesty's dominions called England, and the Town of Berwick on Tweed, and I deliver this as my true  
25 and faithful Specification of the same.

In witness whereof, I, the said John Clay, have hereunto set my hand and seal, this Twenty-first day of July, in the year of our Lord One thousand eight hundred and forty-five.

JOHN (L.S.) CLAY.

30 Signed, sealed, and delivered  
(being first duly stamped) by  
the within-named John Clay  
in the presence of

M. BATESON WOOD,  
Solicitor,  
Manchester.



*Clay's Improved Apparatus for Consuming Smoke.*

Wood, Extra.

AND BE IT REMEMBERED, that on the Twenty-first day of July, in the year of our Lord 1845, the aforesaid John Clay came before our said Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and everything therein contained and specified, in form above written. And also the Specification aforesaid was stamped according to the tenor of the 5 Statute made for that purpose.

Enrolled the Twenty-third day of July, in the year of our Lord One thousand eight hundred and forty-five.

LONDON :

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,  
Printers to the Queen's most Excellent Majesty. 1854.