

Specification of Charles Stevens : smoke-consuming furnaces.

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A.D. 1861, 20th JUNE. N° 1588.

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

OF

CHARLES STEVENS.

SMOKE-CONSUMING FURNACES.

LONDON:

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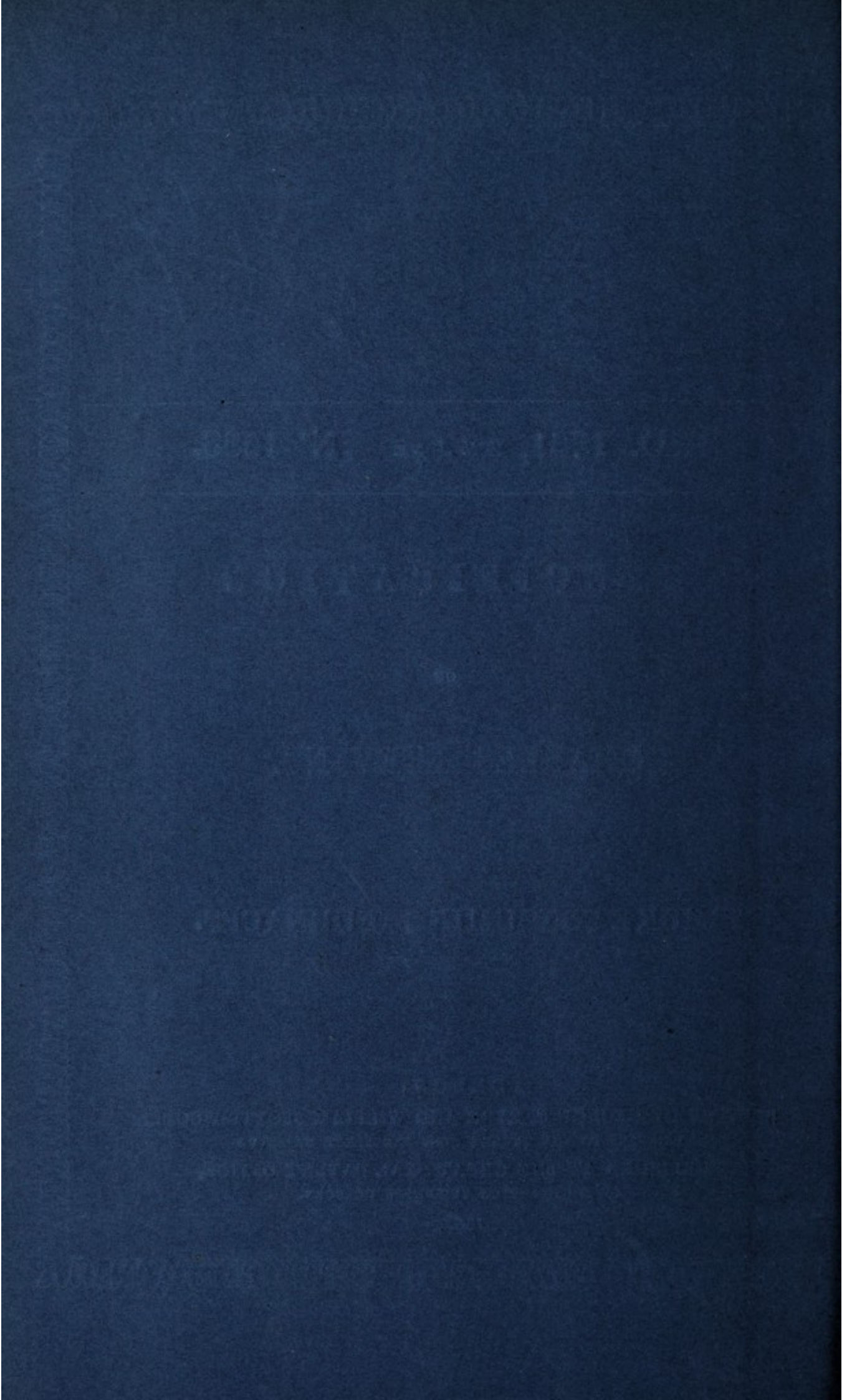
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A.D. 1861, 20th JUNE. N° 1588.

Smoke-consuming Furnaces.

LETTERS PATENT to Charles Stevens, of 31, Charing Cross, in the County of Middlesex, Patent Agent, for the Invention of "**IMPROVEMENTS IN SMOKE-CONSUMING FURNACES.**"—A communication from abroad by Antoine Léonide Lacroix, of 42, Rue Laffitte, Paris, in the Empire of France.

Sealed the 13th December 1861, and dated the 20th June 1861.

PROVISIONAL SPECIFICATION left by the said Charles Stevens at the Office of the Commissioners of Patents, with his Petition, on the 20th June 1861.

I, CHARLES STEVENS, of 31, Charing Cross, in the County of Middlesex, Patent Agent, do hereby declare the nature of the said Invention for "**IMPROVEMENTS IN SMOKE-CONSUMING FURNACES,**" & that it is a communication to me from abroad by Antoine Léonide Lacroix, of 42, Rue Laffitte, Paris, in the Empire of France, to be as follows:—

My Invention consists in a peculiar arrangement given to the brick separation which divides the fire-boxes of two boilers; no extra expense is necessitated in placing it, economy is even effected, in that the solid mass of fire-brick which separates the two fire-boxes is made hollow; by this arrangement the smoke is entirely consumed, and a saving of thirty per cent. realised in the combustable.

The furnace is constructed as follows:—Two grates are placed opposite each other beneath the boiler tubes; rectangular openings are made in the horizontal plan of the grates, which allow a communication from the two fire-

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boxes to a third placed in the middle of them; this third compartment is the smoke consumer, and is itself divided into compartments corresponding with the openings above mentioned, the number of which depends on the length of the grates.

Small separations perpendicular to the longitudinal axis of the furnace 5 divide the smoke-consuming department, but are only half the height of the space which separates the grate from the boiler tubes, in order to allow a free space in the upper part, which causes the products of the combustion to pass in the flue placed in the upper part of the fire bridge.

The direction taken by the flames is as follows:—The air passing through 10 the grate is partly burnt and ascends to the upper part, heats the boiler tubes, and not finding escape descends by the lower openings above-mentioned. These openings of the grates being opposite to each other, the flames unite in the smoke consumer, and produce a combustion of all the volatile products.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed 15 by the said Charles Stevens in the Great Seal Patent Office on the 20th December 1861.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, CHARLES STEVENS, of 31, Charing Cross, in the County of Middlesex, Patent Agent, send greeting. 20

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twentieth day of June, in the year of our Lord One thousand eight hundred and sixty-one, in the twenty-fifth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Charles Stevens, Her special licence that I, the said Charles 25 Stevens, my executors, administrators, and assigns, or such others as I, the said Charles Stevens, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great 30 Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**IMPROVEMENTS IN SMOKE-CONSUMING FURNACES,**" a communication to me from abroad by Antoine Léonide Lacroix, of 42, Rue Laffitte, Paris, in the Empire of France, upon the condition (amongst others) that I, the said Charles Stevens, my executors or administrators, by an instrument in 35 writing under my, or their, or one of their hands and seals, should particularly

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describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

5 **NOW KNOW YE**, that I, the said Charles Stevens, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement, that is to say:—

My Invention relates to improvements in furnaces by the application of
10 which the smoke is entirely consumed, an economy of 30 % is effected in the combustible, and from the simplicity of the construction the furnaces last considerable longer, and the improvements can be easily adapted to existing furnaces. The improved system differs essentially from all the arrangements hitherto known, in that none of its parts are of metal, it consisting simply in
15 the arrangement of the brick partition which separates the fire-boxes of the two boilers. No extra expense is incurred in fitting it, a saving is even effected, the solid mass of brickwork generally separating the two fire-boxes being in the present system converted into a hollow compartment.

The improved furnace is constructed of two grates placed opposite and
20 beneath the boilers rectangular openings 12 inches long by 4½ inches high are made in the horizontal plan of the grates, allowing the divisions of the two fire-boxes to communicate with a third compartment, which is situated between them and in which the smoke is consumed. This third compartment or smoke consumer is divided into other compartments corresponding with the
25 openings made in the grates as above-mentioned, the number of which must depend on the length of the grate. The small divisions perpendicular to the longitudinal axis of the furnace, and serving to separate the smoke consumer into compartments, are only about half the height of the space which separates the grate from the boilers, thus allowing a free space above by which the
30 products of the combustion are conducted into the flue placed at upper part of the fire-bridge of the furnace.

The course taken by the flames is as follows:—The air passes through the grate, is partly burnt, it then ascends and heats the boilers, and finding no
35 escape descends and escapes by the openings above mentioned, which being opposite each other the flames on both sides become united in the smoke consumer. It is by thus uniting that the volatile products are consumed, and to effect this it is necessary that the grates be fed alternately so that only one of the fire-boxes contains fresh coal at a time, the coal being in the other almost or entirely converted into coke.

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Having thus described my Invention, what I claim and desire to secure by Letters Patent is the introduction of a smoke-consuming compartment between the two fire-boxes in the manner and for the purposes herein-before described.

In witness whereof, I, the said Charles Stevens, have hereunto set my hand and seal, this Twentieth day of December, in the year of our Lord One thousand eight hundred and sixty-one.

CHARLES STEVENS. (L.S.)

LONDON:

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Printers to the Queen's most Excellent Majesty. 1861.