

Specification of Charles Frederick Stansbury : furnaces of locomotive and other steam boilers.

Contributors

Stansbury, Charles Frederick.

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A.D. 1854 N° 1717.

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

OF

CHARLES FREDERICK STANSBURY.

FURNACES OF LOCOMOTIVE AND OTHER
STEAM BOILERS.

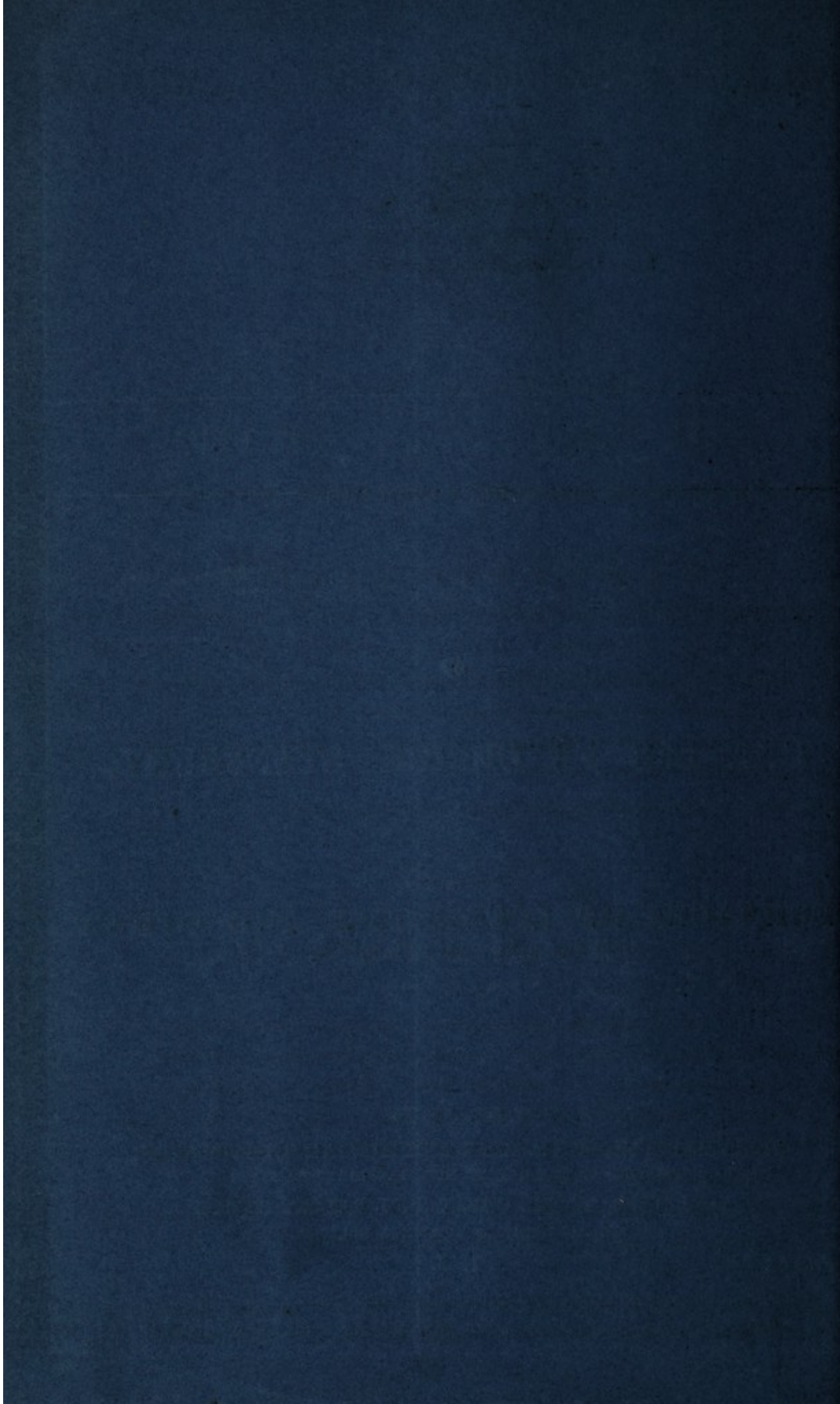
L O N D O N :

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Price 6d.

1855.





A.D. 1854 N° 1717.

Furnaces of Locomotive and other Steam Boilers.

LETTERS PATENT to Charles Frederick Stansbury, of the firm of Nourse & Co., American and General Patent Agents, of No. 17, Cornhill, London, for the Invention of "**IMPROVEMENTS IN LOCOMOTIVE AND STEAM BOILER FURNACES.**"—A communication from Jonathan Amory and William Parrott, both of Boston, in the State of Massachusetts and United States of America.

Sealed the 2nd February 1855, and dated the 5th August 1854.

PROVISIONAL SPECIFICATION left by the said Charles Frederick Stansbury at the Office of the Commissioners of Patents, with his Petition, on the 5th August 1854.

I, CHARLES FREDERICK STANSBURY, of the firm of Nourse & Co., American
5 & General Patent Agents, of No. 17, Cornhill, London, do hereby declare the nature of the said Invention for "**IMPROVEMENTS IN LOCOMOTIVE AND STEAM BOILER FURNACES,**" a communication from Jonathan Amory & William Parrott, both of Boston, in the State of Massachusetts, and United States of America, to be as follows:—

10 The object of these improvements is to economize fuel and to prevent the formation of smoke by perfecting the combustion which takes place in the furnace.

32 This object it is proposed to effect by two means; one, the supplying of pure heated air to the fire, by means of a pipe passing from the external air into the

Stansbury's Improvements in Locomotive and Steam Boiler Furnaces.

furnace through heated portions of its structure; and the other, the drawing off the carbonic acid gas or other heavy and incombustible gases from the furnace, by means of a pipe passing from the lower portion of the furnace, where such gases would naturally be found, into the smoke flue or chimney.

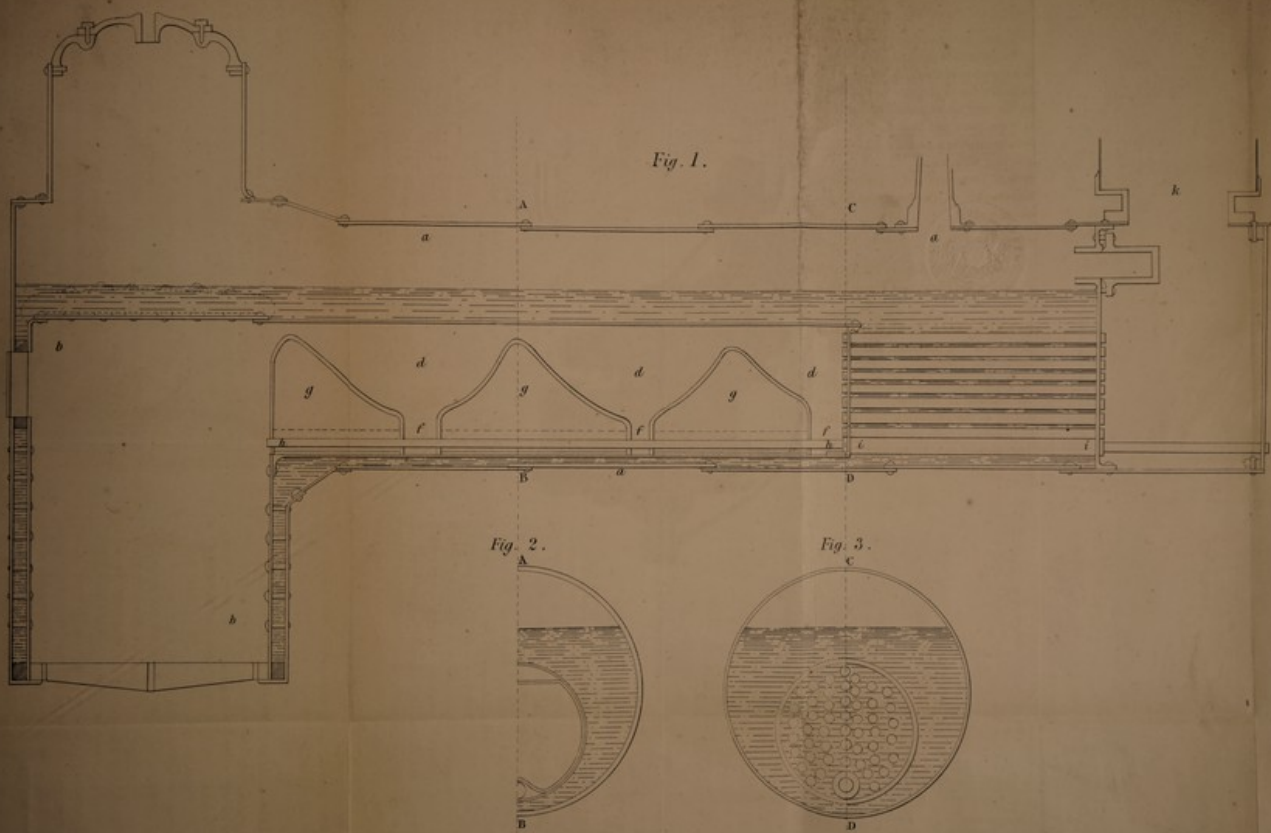
The pipe which introduces the pure air may be so arranged as to pass 5 through the pipe which carries off the heavy gases, and thus the heat of the latter be saved. I contemplate this arrangement as a part of my Invention, and prefer it to making the pipes separate and independent.

This Invention is applicable to a variety of locomotive and boiler furnaces, but is more especially intended as an improvement on the furnace of Henry 10 F. Baker, patented in England, 22d December 1847.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Charles Frederick Stansbury in the Great Seal Patent Office on the 3rd February 1855.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, CHARLES 15 FREDERICK STANSBURY, of the firm of Nourse & Co., American and General Patent Agents, of No. 17, Cornhill, London, send greeting.

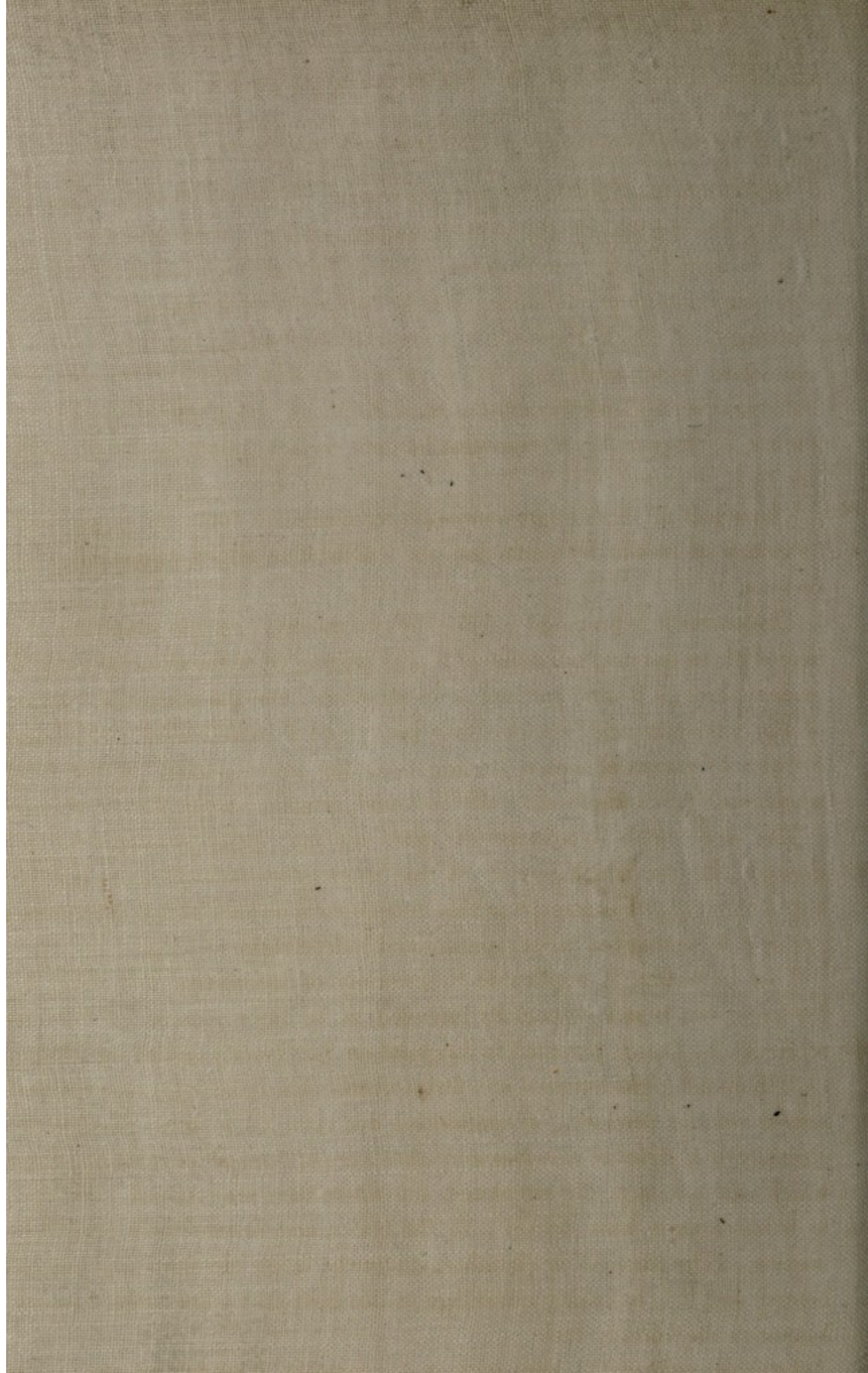
WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Fifth day of August, in the year of our Lord One thousand eight hundred and fifty-four, in the eighteenth year of Her 20 reign, did, for Herself, Her heirs and successors, give unto me, the said Charles Frederick Stansbury, Her special licence that I, the said Charles Frederick Stansbury, my executors, administrators, and assigns, or such others as I, the said Charles Frederick Stansbury, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and 25 at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**IMPROVEMENTS IN LOCOMOTIVE AND STEAM BOILER FURNACES,**" a communication from Jonathan Amory and William Parrott, both of Boston, in the State of 30 Massachusetts, and United States of America, upon the condition (amongst others) that I, the said Charles Frederick Stansbury, by an instrument in writing under my hand and seal, should particularly 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 35 within six calendar months next and immediately after the date of the said Letters Patent.



stated drawing is partly colored.

Drawn and Coloured by J. H. Stansbury.

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Printers to the Queen's most Excellent Majesty. 1854.



Stansbury's Improvements in Locomotive and Steam Boiler Furnaces.

NOW KNOW YE, that I, the said Charles Frederick Stansbury, 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, reference being had to the accompanying Sheet of
5 Drawings, in which Figure 1 is a central, longitudinal, vertical section of a locomotive boiler with my improvements applied thereto; Figure 2 is a transverse vertical section of the same, taken in the plane of the line A, B, Figure 1; Figure 3 is a transverse vertical section, taken in the plane of the line C, D, Figure 1.

10 The object of these improvements is to economize fuel and to prevent the formation of smoke by perfecting the combustion which takes place in the furnace.

This object it is proposed to effect by two means; one, the supplying of pure heated air to the fire, by means of a pipe passing from the external air into the
15 furnace through heated portions of its structure; and the other, the drawing off of the carbonic acid gas or other heavy and incombustible gases from the furnace, by means of a pipe passing from the lower portion of the furnace, where such gases would naturally be found, into the smoke flue or chimney.

The pipe which introduces the pure air may be so arranged as to pass
20 through the pipe which carries off the heavy gases, and thus the heat of the latter be saved. I contemplate this arrangement as part of my Invention, and prefer it to having the pipes separate and independent.

This Invention is applicable to a variety of locomotive and other boiler furnaces, but is more especially intended as an improvement on the furnace
25 of Henry F. Baker, patented in England on the Twenty-second of December One thousand eight hundred and forty-seven. In Baker's furnace the unconsumed volatile products of combustion are retarded in their passage to the chimney by a series of reverberatory chambers of semi-elliptical form, through which said products are circulated, and where they are retained long enough
30 to exhaust their heat, deliver it to the boiler, and ensure their perfect combustion. The passages or chambers under the boiler are thus kept constantly heated, and it is by taking advantage of this heat that I am enabled to deliver hot air to the burning fuel.

In the accompanying Drawings, *a, a*, represent a locomotive steam boiler,
35 surrounding and enclosing a furnace constructed on Baker's plan; *b, b*, is the fire chamber; *d, d*, &c. a series of reverberatory chambers, formed by the bridges *e, e*, and communicating with the fire chamber *b, b*. In a stationary engine these chambers *d, d*, &c. may also communicate by means of the spaces *f, f*, with a series of ovens *g, g*, under the fire bridges *e, e*. The

Stansbury's Improvements in Locomotive and Steam Boiler Furnaces.

chambers, spaces, and ovens are kept hot by the reverberation of the flame in its passage from the furnace to the chimney. Near the bottom of the furnace and through the fire bridges *e, e*, I insert a pipe or tube *h, h*, one end of which enters into the fire chamber *b, b*, while the other communicates with the cold external air. This pipe being kept hot by the circulation of the heated 5 currents in the chambers, &c. heats the air which passes through it to the fire, improving the combustion by means of heat otherwise wasted. Instead of entering the fire chamber, the pipe *h, h*, may enter either of the chambers *d, d*, or a separate pipe may conduct air to each or any number of said chambers.

The pipe for conducting off heavy and incombustible gases is marked *i, i*, in 10 the Drawings. It is placed near the bottom of the furnace at the end most remote from the fire chamber. One end of this pipe opens into the smoke pipe *k*, into which the carbonic acid and other heavy products escape through the pipe *i, i*. This pipe is represented as surrounding the pipe *h, h*, but they may be separate, if preferred. I prefer the arrangement shown, as the heat 15 of the escaping gases is this imparted to the entering air.

The ovens *g, g*, under the fire bridges *e, e*, may be constructed so as to contain water and form part of the boiler, or to contain air, as the nature of the work or the fuel employed may require.

Having thus described my improvements, what I claim under the above in 20 part recited Letters Patent is,—

First, conducting off the heavy gaseous products of combustion by means of a pipe connecting the lower portion of the furnace with the smoke pipe or flue.

And, second, surrounding the induction pipe *h, h*, with a larger eduction 25 pipe *i, i*, by which means the heat of the escaping heavy gaseous products is imparted to the pure air entering to supply the fire.

In witness whereof, I, the said Charles Frederick Stansbury, have here-
unto set my hand and seal, this Third day of February, in the year of
our Lord One thousand eight hundred and fifty-five. 30

CHARLES FREDERICK STANSBURY. (L.S.)

LONDON:

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Printers to the Queen's most Excellent Majesty. 1855.