

Specification of John Henry Johnson : furnaces.

Contributors

Johnson, John Henry.

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A.D. 1855 N° 896.

SPECIFICATION

OF

JOHN HENRY JOHNSON.

FURNACES.

LONDON:

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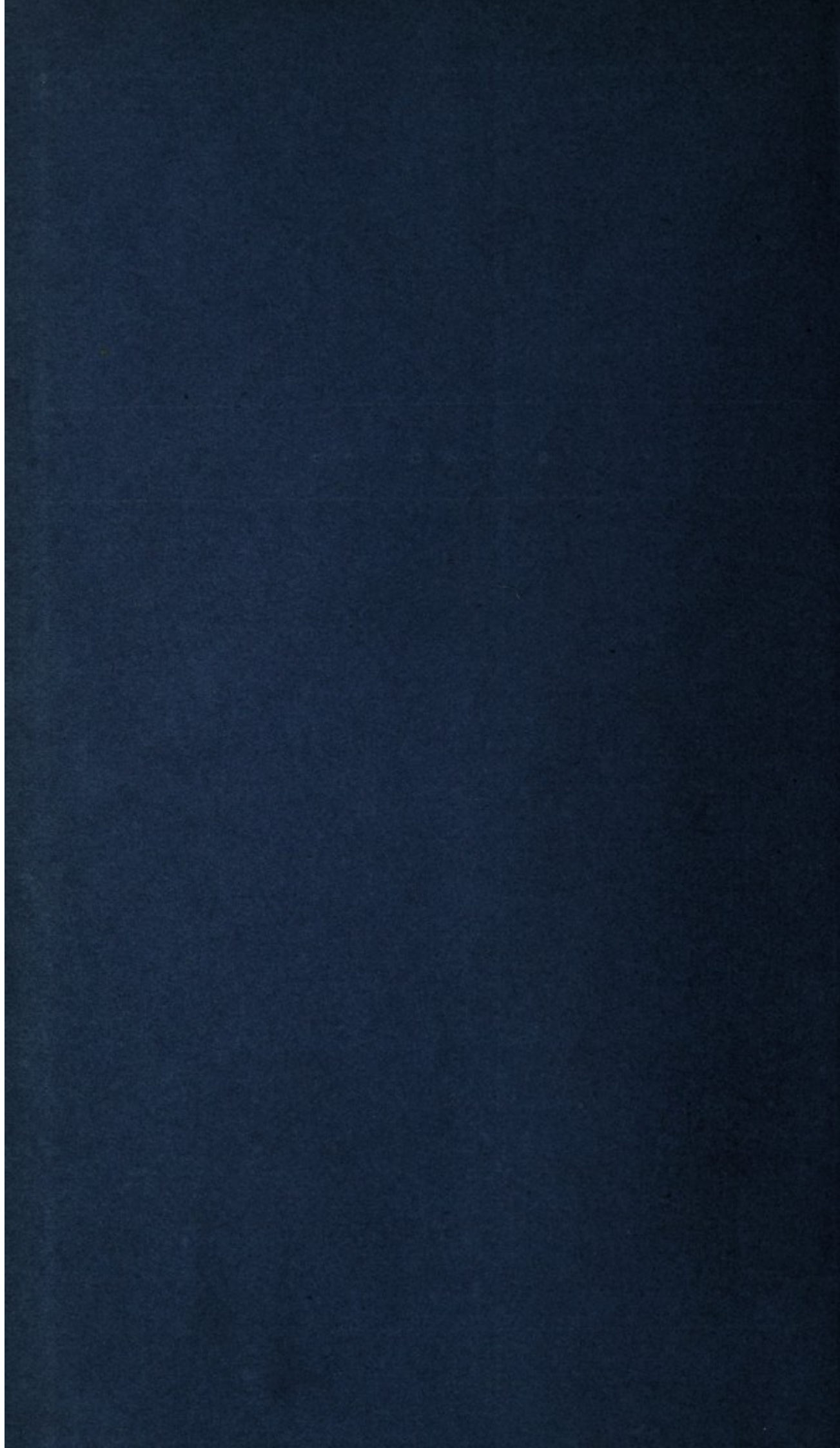
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A.D. 1855 N^o 896.

Furnaces.

LETTERS PATENT to John Henry Johnson, of 47, Lincoln's Inn Fields, in the County of Middlesex, and of Glasgow, North Britain, Gentleman, for the Invention of "**IMPROVEMENTS IN THE CONSUMPTION OR PREVENTION OF SMOKE.**"—A communication from René Garcon, of Paris, in the Empire of France, Accountant.

Scaled the 26th June 1855, and dated the 21st April 1855.

PROVISIONAL SPECIFICATION left by the said John Henry Johnson at the Office of the Commissioners of Patents, with his Petition, on the 21st April 1855.

I, JOHN HENRY JOHNSON, of 47, Lincoln's Inn Fields, in the County of Middlesex, & of Glasgow, North Britain, Gentleman, do hereby declare the nature of the said Invention for "**IMPROVEMENTS IN THE CONSUMPTION OR PREVENTION OF SMOKE,**" a communication to me from René Garcon, of Paris, in the Empire of France, Accountant, to be as follows:—

This Invention relates to a peculiar construction and arrangement of steam boilers & other furnaces, whereby the prevention of smoke is effected, and consists in the employment of a second fire-place at the back of the main furnace, but immediately behind the bridge, such fire-place being composed of a number of fire bricks or lumps placed on edge at small intervals apart, the front end of such bricks being bevilled or sloping, so as to allow the incan- descent fuel to rest thereon. Beneath these bricks is formed a second ash-pit, communicating with the main ash-pit by an open doorway. One or more series of fire bricks are placed longitudinally in the passage from the furnace to the flues, which bricks serve to divide the smoke, & by their intense heat

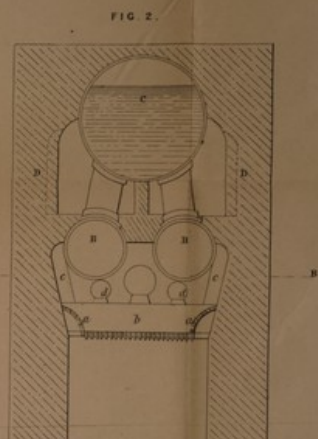
Johnson's Improvements in the Consumption or Prevention of Smoke.

assist in consuming the gases and unburnt smoke. A cast-iron box or chamber is fitted on each side of the main furnace, such boxes having perforations formed therein to admit the air from the ash-pit & allow it to enter the furnace. A number of spheres of fire clay may be placed in the flues, or between the auxiliary boilers when such are employed, these spheres being 5 placed at distances apart, equal at least to their diameters. They are placed between & rest loosely upon the circumferences of the two auxiliary boilers, and are also placed between the sides of these boilers & the sloping sides of the flues. These spheres become highly heated, and divide the smoke and gases most effectually on their passage to the back flue. The sloping or bevilled fire 10 bricks are made of great length, so that as the smoke and gases pass through the incandescent fuel thereon and traverse between their heated sides, they may be effectually consumed before arriving at the chimney.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said John Henry Johnson in the Great Seal Patent Office on the 15 20th October 1855.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JOHN HENRY JOHNSON, of 47, Lincoln's Inn Fields, in the County of Middlesex, and of Glasgow, North Britain, Gentleman, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters 20 Patent, bearing date the Twenty-first day of April, in the year of our Lord One thousand eight hundred and fifty-five, in the eighteenth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said John Henry Johnson, Her special license that I, the said John Henry Johnson, my executors, administrators, and assigns, or such others 25 as I, the said John Henry Johnson, my executors, administrators, or 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 Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**Im- 30** PROVEMENTS IN THE CONSUMPTION OR PREVENTION OF SMOKE," a communication from René Garçon, of Paris, in the Empire of France, Accountant, upon the condition (amongst others) that I, the said John Henry Johnson, 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 35 was to be performed, and cause the same to be filed in the Great Seal Patent





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Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said John Henry Johnson, do hereby declare the nature of the said Invention, and in what manner the same is
5 to be performed, to be particularly described and ascertained in and by the following statement, reference being had to the accompanying Drawings, and to the letters and figures marked thereon, that is to say:—

The said Invention relates to a peculiar construction and arrangement of furnace, whereby the prevention of smoke is effected, and consists principally
10 in the employment of a second fire-place behind the bridge of the furnace, such fire-place being composed of a number of fire bricks or lumps placed on edge in a longitudinal direction at small intervals apart, the front end of such bricks being bevilled or sloping, to allow the incandescent fuel to rest thereon. Beneath this second fire-place is formed a second ash-pit, communicating with
15 the main ash-pit by means of an arch, which may be readily opened when requisite. A cast-iron chamber or arch is placed on each side of the main furnace, such chamber or arch being perforated to admit the air from the ash-pit, and allow it to enter at the sides of the fire. A number of spheres of fire clay are placed on the bridge between it and the bottom of the boiler,
20 or auxiliary boilers when such are employed. These spheres are placed at distances apart, at least equal to their diameter, and so arranged as to divide the smoke and gases on their passage to the back flue, and becoming highly heated, greatly assist the combustion of the same. The sloping or bevilled fire bricks are made of great length, so that as the smoke and gases pass over
25 the incandescent fuel thereon and between their heated sides or surfaces, they become effectually consumed before arriving at the chimney.

And in order that the said Invention may be fully understood, I shall now proceed particularly to describe the same; and for that purpose I shall refer to the several Figures on the Sheet of Drawings hereunto annexed, the same
30 letters of reference indicating corresponding parts throughout all the Figures.

Figure 1 is a vertical and longitudinal section of a furnace with my Invention applied thereto; Figure 2 is a transverse section through the main fire-place; and Figure 3 is a horizontal section through the line A, B, in Figure 2. A is the main fire-place; B, B, the auxiliary boilers; and C, C, the main boiler, sup-
35 ported upon the brickwork D, D. *a, a*, are the cast-iron perforated chambers for the admission of air from the ash-pit to the sides of the fire. Upon the bridge *b* and at each side of the fire-place are two projections *c, c*, in fire brick, extending from the walls of the furnace to the sides of the auxiliary boilers B, B, so as to produce a slight contraction at this point, causing the hot gases

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and air to become mixed and to pass between the spheres of fire clay *d, d*, which by their position become greatly heated, and by their power of radiation in all directions cause the air and products of combustion to become thoroughly mixed and consumed; *e, e*, is the second fire-place, composed of plates or lumps of fire clay, of the form shewn in Figures 1 and 3, placed on edge, at 5 short intervals apart. When the fire is well sustained, the plates *e* attain a white heat, and by their radiation not only complete the combustion of the smoke and gases, but also greatly assist the heating of the boiler, and consequently effect a considerable economy in the consumption of fuel. The plates *e* and the bridge *b* are supported upon arches, which are filled in with light 10 walls *f, f*, which prevent the the passage of the air or flame under the arch, and can be easily removed and replaced when necessary for repairing or cleaning out the second ash-pit, or (if preferred) they may be provided with doors closing air-tight, or nearly so.

Having now described and particularly ascertained the nature of the said 15 Invention, and the manner in which the same is or may be used or carried into effect, I would observe, in conclusion, that I do not confine or restrict myself to the precise details or arrangements which I have had occasion to describe or refer to, as many variations may be made therefrom without deviating from the principles or main features of the said Invention; but what I consider to be 20 novel and original, and therefore claim as the Invention secured to me by the herein-before in part recited Letters Patent, is,—

Firstly, the construction and application of the fire-place of fire bricks, or vertical slabs of fire clay, of the form shewn and described.

Secondly, I claim the peculiar construction and arrangement of the air 25 passages at the sides of the furnace.

Thirdly, I claim the use of projections from the walls for the purpose of contracting the furnace at the bridge.

And, fourthly, the application at the bridge of the spheres of fire clay for mixing the air and products of combustion, and assisting the consumption of 30 the same by their radiation of heat.

In witness whereof, I, the said John Henry Johnson, have hereunto set my hand and seal, the Twentieth day of October, One thousand eight hundred and fifty-five.

J. HENRY JOHNSON. (L.S.) 35

LONDON:

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