Specification of James Newton : consuming smoke and economizing fuel.

A.D. 1872, 14*th* DECEMBER. N° 3798.

SPECIFICATION

OF

JAMES NEWTON.

CONSUMING SMOKE AND ECONOMIZING FUEL.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
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A.D. 1872, 14*th* DECEMBER. N° 3798.

Consuming Smoke and Economizing Fuel.

LETTERS PATENT to James Newton, of New Wortley, in the Borough of Leeds, in the County of York, Flour Mill Manager, for the Invention of "IMPROVEMENTS IN THE MEANS OF AND APPARATUS FOR CONSUMING SMOKE AND ECONOMIZING FUEL."

Sealed the 10th June 1873, and dated the 14th December 1872.

PROVISIONAL SPECIFICATION left by the said James Newton at the Office of the Commissioners of Patents, with his Petition, on the 14th December 1872.

I, JAMES NEWTON, of New Wortley, in the Borough of Leeds, in the County of York, Flour Mill Manager, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN THE MEANS OF AND APPARATUS FOR CONSUMING SMOKE AND ECONOMIZING FUEL," to be as follows :—

The object of this Invention is to effectually consume the gaseous products of combustion arising from the burning fuel in the fire-place,

so that the heat evolved therefrom may be more completely utilized than heretofore, and the fuel thereby economized. To this end the fire-place (constructed partly of fire-brick and partly of iron) is placed at the front end of the boiler, and partly projects into the flue, which is constructed of brickwork and of a serpentine form, so that the heat may be abstracted from the gases as they travel forward. In order to keep the gasses in motion along the flues they are drawn forward by means of an aspirating fan actuated by a small engine fixed on the boiler, or by any other convenient motive power. The gases as they are thus drawn forward along the flues are supplied with a certain quantity of air, which will assist in promoting their combustion, and that portion which is not consumed will be forced by the fan or other motive power through the incandescent fuel, and be thereby effectually consumed, so that none of the combustible parts will be wasted. A chimney shaft to promote a draft may be connected with the flues, so that in the event of the fan getting out of order the action of the furnace and boiler need not be stopped.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said James Newton in the Great Seal Patent Office on the 14th June 1873.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JAMES NEWTON, of New Wortley, in the Borough of Leeds, in the County of York, Flour Mill Manager, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Fourteenth day of December, in the year of our Lord One thousand eight hundred and seventy-two, in the thirty-sixth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said James Newton, Her special licence that I, the said James Newton, my executors, administrators, and assigns, or such others as I, the said James Newton, 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 Britain and Ireland, the Channel

Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN THE MEANS OF AND APPARATUS FOR CONSUMING SMOKE AND ECONOMIZING FUEL," upon the condition (amongst others) that I, the said James Newton, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, 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 within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said James Newton, 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 Drawing hereunto annexed, and to the letters and figures marked thereon (that is to say) :—

The object of this Invention of "Improvements in the Means of and Apparatus for Consuming Smoke and Economizing Fuel," is to effectually consume the gaseous products of combustion arising from the burning fuel in the fire-place, as that the heat evolved therefrom may be more completely utilized than heretofore, and the fuel thereby economized.

In the accompanying Drawing I have shewn the means whereby this may be effected. Fig. 1 is a longitudinal vertical section, taken through a boiler and furnace and part of the flues; Fig. 2 is an external end elevation of the apparatus. The fire-place (constructed partly of fire-brick and partly of iron) is placed at the front end of the boiler and projects into the flue which runs through the boiler, and may be partly constructed of brickwork. The flue is of a serpentine form, as shewn in the sectional plan view, Fig. 3, of a modification of the boiler and fire-place shewn at Fig. 1. By constructing the flues in this manner the heat may be abstracted from the gases as they travel forward and before they reach the exit flue or chimney or the blower hereafter referred to.

The fire-place *a* is constructed with inclined fire-bars, and is fed from a hopper *b* above, and therefore requires no fire door. The ash-pit *c* is enclosed, but it is supplied with air by a ventilator or fan. Beyond the

fire-bars there is a chamber *d* to receive the clinkers as they are removed by the stoker from the brass *a*. This chamber is provided with a door, through which the clinkers may be withdrawn. Its bottom, which is preferably made of metal, may be perforated to allow air to pass up through the clinkers into the flue *e* to assist in consuming the combustible gases therein. A tubular chamber *f* is constructed of brickwork in the flue, and air is admitted therefrom into the flues.

In order to keep the gases in motion along the flues *e*, e^1, in the direction of the arrows in Fig. 3, they are drawn forward by means of an aspirating fan *g*, Fig. 2, actuated by a small engine fixed on the boiler, but not shewn in the Drawing, or by any other convenient motive power. The gases as they are thus drawn forward along the flues are supplied with a certain quantity of air, which will assist in promoting their combustion, and those portions which are not consumed will be forced by the fan *g* or other motive power into the box g^1, Figures 1 and 2, and from thence into the ash-pit, and through the incandescent fuel on the fire-bars, so that they will be effectually consumed, and none of the combustible parts will be wasted. A chimney shaft to promote a draught may be connected with the flues, so that in the event of the fan getting out of order the action of the furnace and boiler need not be stopped.

Fig. 4 is a longitudinal vertical section of another construction of furnace, but on the same principle as Fig. 1; Fig. 3 is a sectional plan view, shewing the serpentine arrangement of the flues; and Fig. 5 is an external end elevation of Fig. 4.

The fan *g* may be made to suck in a certain quantity of air with the combustible gases which pass along the flues, so that when the mixed gases are forced into the fire-place they may be effectually consumed.

Having now described my Invention of "Improvements in the Means of and Apparatus for Consuming Smoke and Economizing Fuel," and having explained the manner of carrying the same into effect, I claim as the Invention secured to me by Letters Patent as aforesaid, causing the combustible gases evolved from the fuel to pass along a serpentine arrangement of flues constructed partly of fire-brick, where their temperature will be raised, and they will be consumed or partly consumed by the admission of air thereto, and all unconsumed combustible gases

will be drawn forward by an exhausting apparatus, and forced through the incandescent fuel, as and for the purpose herein set forth.

In witness whereof, I, the said James Newton, have hereunto set my hand and seal, the Thirteenth day of June, in the year o Our Lord One thousand eight hundred and seventy-three.

JAMES NEWTON. (L.S.)

Signed and sealed by the said
James Newton in my presence,
BENJN. PULLAN,
Sol.,
Leeds.

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1873.

A.D. 1872. Dec. 14. N° 3736.
NEWTON'S SPECIFICATION.

(1 SHEET)

FIG. 1.

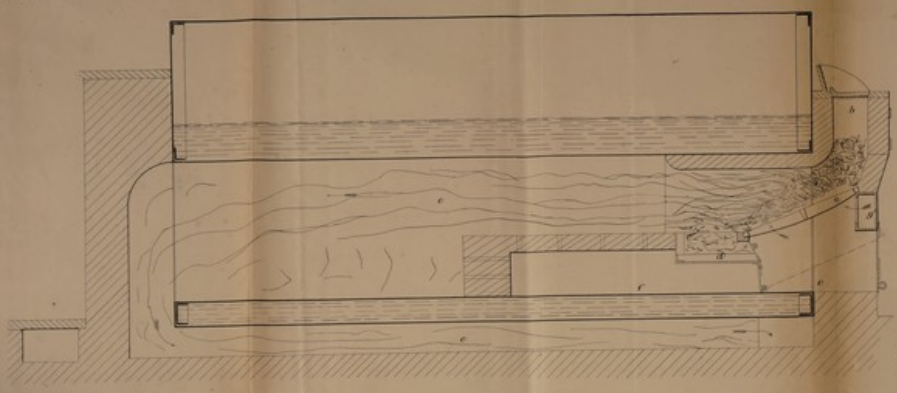


FIG. 2.

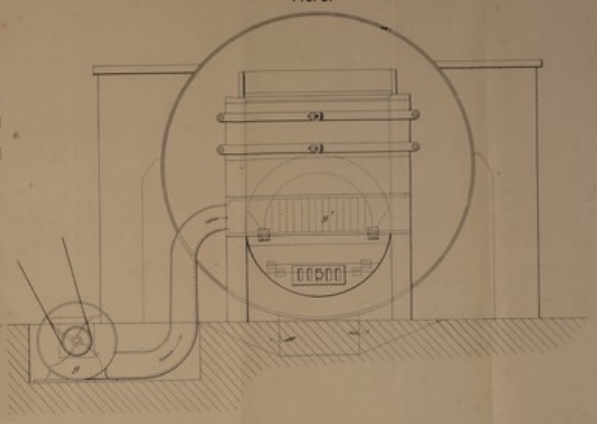


FIG. 4.

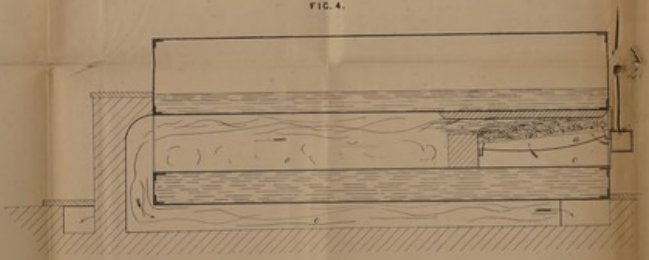


FIG. 5.

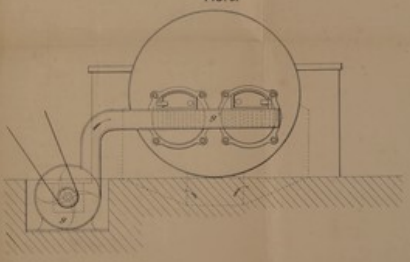
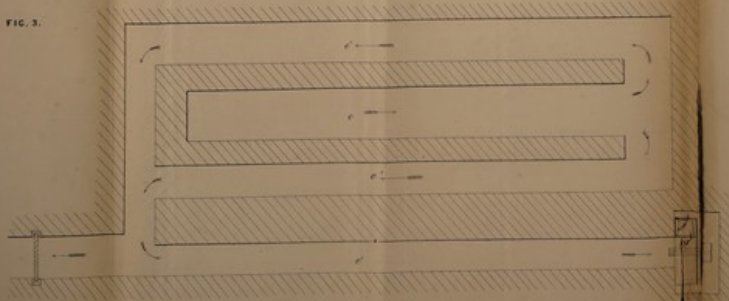


FIG. 3.



The filed drawing is partly coloured

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