Specification of Jonathan Dickson : furnaces : machinery for giving motion to the fire-bars and supplying coal thereto : smoke condenser, &c.;

Contributors

Dickson, Jonathan.

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A.D. 1821 . . . . . N° 4541.

SPECIFICATION

OF

JONATHAN DICKSON.

FURNACES; MACHINERY FOR GIVING MOTION TO THE FIRE-BARS AND SUPPLYING COAL THERETO; SMOKE CONDENSER, &c.

LONDON:

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1855.

A.D. 1821 . . . . . N° 4541.

Furnaces; Machinery for giving Motion to the Fire-bars and supplying Coal thereto; Smoke Condenser, &c.

DICKSON'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JONATHAN DICKSON, of Holland Street, Blackfriars, in the County of Surry, Engineer, send greeting.

WHEREAS His present Majesty King George the Fourth, in and by His Letters Patent under the Great Seal of the United Kingdom of Great Britain and Ireland, bearing date at Westminster, the Fifth day of March last, for Himself, His heirs and successors, did give and grant unto me, the said Jonathan Dickson, His special licence, full power, sole privilege and authority, that I, the said Jonathan Dickson, my exors, admors, and assigns, and every of them, by myself and themselves, or by my or their deputy or deputies, servants or agents, or such others as I, the said Jonathan Dickson, my exors, admors, or assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term of years therein expressed, should and lawfully might make, use, and exercise, and vend, within England, Wales, and the Town of Berwick upon Tweed, my Invention of "DIVERS VALUABLE IMPROVEMENTS IN THE MEANS OF TRANSMITTING HEAT, AND ALSO IN THE MEANS OF TRANSMITTING COLD FROM ONE BODY TO ANOTHER, WHETHER SOLIDS OR FLUIDS;" in which said Letters Patent there is contained a proviso obliging me, the said Jonathan Dickson, by an instrument in writing under my hand and seal, particularly to describe and ascertain the nature of my said Invention, and in what manner the same is to be performed, and to cause the same to be inrolled

in His Majesty's High Court of Chancery within two calendar months next and immediately after the date of the said recited Letters Patent, as in and by the same, reference being thereunto had, will more fully appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Jonathan Dickson, do hereby describe and ascertain the nature of my said Invention, and in what manner the same is to be performed, by the following description thereof, that is to say :—

My improvements in the means of transmitting or communicating heat to bodies are by a furnace, the grate or fire bars of which I cause to move backward and forward by any mechanical apparatus made in the common way for that purpose, such as a calender motion, a mangle motion, or the like; this furnace I make of iron and other fit and proper material or materials in the common way; and I make it either square, oblong, or any other shape to suit the place where it is intended to be used; to each end or side of the moveable frame that carries the fire bars I attach a plate, each of whose length or width is at least equal to the distance that the furnace or grate is intended to move; these plates move in grooves and prevent the admission of cold air into the furnace at this part, and the whole is placed upon two or moore wheels or rollers, the axis of which is supported by two bars fixed in the brickwork, one on each side of the ash-pit; these bars are placed at a proper distance to allow the grate, frame, and plates to move freely betwixt them, and they have rabited edges to cover the space between them and the moveable frame and plates; this space is nearly filled with ashes or other small particles while the furnace is at work, and prevents the admission of cold air at this part. I next convey the coal or other fuel upon the fire from a hopper fixed on the top or sides of any boiler or vessel intended to heat water or other fluids; from the bottom of this hopper is a pipe which leads through the boiler, or I make the boiler in separate apartments, and leave a space between where they are connected together, and through this space or pipe the coal is conveyed upon the fire by means of a wheel or roller placed at the bottom of the hopper ; in the circumference of this roller are a number of grooves, recesses, or apertures, made either in a line parallel to the axis or in a spiral direction round the roller, and when the coal is prepared by being made of a proper size to suit the cavities in the roller and put into the hopper, it is evident that the grooves or apertures on the upper side of the roller will be filled with part of the coals in the hopper, because the roller forms part of the bottom thereof. I then turn the roller round upon its axis by means of a lever and handle, a wheel and pinion, or any other mechanical apparatus, and the grooves or cavities that alternately get filled with coals at the top side of the roller regularly empty

themselves as they turn downwards into the pipe that conveys them upon the fire-place or grate, which at the same time is moving backwards and forwards, and thereby receives an uniform supply all over its surface, as the length of the roller and conveyance pipe or space for the coal is nearly equal to the width of the moveable grate on which the coals fall; and I place sliding plates at the bottom of the hopper, either above or below the roller, or both, for the purpose of admitting and regulating the supply of fuel. I also make use of doors and registers, and other openings into the furnace, in the common way, for lighting and cleaning the fire and for other purposes; the furnace being thus constructed, and the means of supplying it with coal, I then give motion to the whole by means of a wheel placed in the flew or chimney in the most advantageous manner, so that the current of rarefied air and smoke may act upon any convenient number of vanes or wings placed in the circumference thereof; and I also make use of manual labor or any other convenient power in the common way for this purpose; and instead of wheels or rollers for this furnace or grate to move upon as aforesaid, I also place it upon a centre at a convenient distance underneath the furnace, or suspended from a centre above it, according to circumstances and situations and the shape of the boiler to which it may be applied, and give motion to it by the same means as aforesaid; and I also apply this furnace or grate, and the said means of supplying it with fuel, for the purpose of heating solid bodies and smelting ores and metals or for calcining and heating any substances whatsoever; and my improvements in the means of transmitting or communicating cold are by applying a vessel made of iron or other materials, so as to contain water, which vessel I call a smoke condenser, soot collector, or any other name that the uses to which it is applied may suggest; this vessel or cistern I make of any size according to circumstances, and place it between the boiler or vessel and its chimney used for the purpose of heating water or other fluids, or between any furnace or stove and its chimney used for smelting or calcining any substances; the said vessel or cistern is kept about half full of water, and has openings at its opposite ends nearly equal to the area of the flue to which it is applied; the height of these openings or passages is very small compared with the horizontal measurement, so that it causes the current of rarefied air and smoke to enter it in a thin horizontal sheet or stream; at the same time I cause one or more showers, streams, or sheets of water to fall perpendicularly from the top part of the cistern, or by any mechanical means produce jets of water, so as to cool the passing current of air, &c.; consequently the current of rarefied air and smoke passes through one or more streams, showers, sheats or jets of water, which will extinguish all the fiery sparks, and deprive it of the sooty and other noxious vapours; and when circumstances require it,

I also cause the smoke to pass through a certain depth of water in the cistern or vessel, by means of placing a plate or false top inside of the said vessel, under which the current of rarefied air and smoke passes, and one end of this plate is either lowered near to or into the water contained in the said cistern, or the water is caused to raise near to or above the said plate to any height required; and to assist the draft when necessary, I cause a large space at or near the bottom of the chimney to be exhausted by any machanical apparatus applied for that purpose, or by rarefying the atmospheric air in the said space by means of heated pipes in the common way.

In witness whereof, I, the said Jonathan Dickson, have hereunto set my hand and seal, this Fourth day of May, One thousand eight hundred and twenty-one.

JONATHAN DICKSON. (L.S.)

AND BE IT REMEMBERED, that on the Fourth day of May, in the year of our Lord 1821, the aforesaid Jonathan Dickson came before our said Lord the King in His 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 Statute made for that purpose.

Inrolled the Fourth day of May, in the year of our Lord One thousand eight hundred and twenty-one.

DOWDESWELL.

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