Specification of James Neville : apparatus for generating steam.

A.D. 1826 . . . . . N° 5344.

SPECIFICATION

OF

JAMES NEVILLE,

APPARATUS FOR GENERATING STEAM.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY:
PUBLISHED AT THE QUEEN'S PRINTING OFFICE, EAST HARDING STREET,
NEAR FLEET STREET.

Price 10*d.*

1854.

A.D. 1826 . . . . . N° 5344.

Apparatus for Generating Steam.

NEVILLE'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JAMES NEVILLE, of New Walk, Shad Thames, in the County of Surrey, Engineer, send greeting.

WHEREAS His most Excellent Majesty George the Fourth, by His Letters Patent under the Great Seal of Great Britain, bearing date on or about the Fourteenth day of March, in the seventh year of His reign, did, for Himself, His heirs and successors, give and grant unto me, the said James Neville, my executors, administrators, and assigns, His special licence, full power, sole privilege and authority, that I, the said James Neville, my executors, administrators, and assigns, and every of them, by myself and themselves, or by and their deputy or deputies, servants or agents, or such others as I, the said James Neville, 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 of fourteen years therein expressed, should and lawfully might make, use, exercise, and vend, within that part of His Majesty's United Kingdom of Great Britain and Ireland called England, His Dominion of Wales, and Town of Berwick upon Tweed, and also in all his Majesty's Colonies and Plantations abroad, in such manner as to me, the said James Neville, my executors, administrators, and assigns, or any of them, should in his or their discretion seem meet, my Invention of "A NEW AND IMPROVED BOILER OR APPARATUS FOR GENERATING STEAM WITH LESS EXPENDITURE OF FUEL," to hold the said licence, powers, privileges, and advantages o me, my executors, administrators, and assigns, for and during and unto the full end and term of fourteen years from the date of the said Letters

Patent next and immediately ensuing; and in which said Letters Patent is contained a proviso that if I, the said James Neville, should not particularly describe and ascertain the nature of my said Invention, and in what manner the same is to be performed, by an instrument in writing under my hand and seal, and cause the same to be inrolled in His Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said Letters Patent, that then the said Letters Patent, and all liberties and advantages whatsoever thereby granted should utterly cease, determine, and become void, anything therein-before contained to the contrary thereof in anywise notwithstanding.

NOW KNOW YE, that in compliance with the said proviso, I, the said James Neville, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed, is particularly described and ascertained in the explanation thereof now next following (that is to say):—

I declare and describe the object and nature of my said Invention or improvement to be, first, to generate or produce an equal quantity of steam by means of a new and improved boiler or apparatus which shall occupy less space than the boilers usually employed for such purpose; and, secondly, to effect a saving of fuel by presenting a greater metallic surface, so formed and arranged that the water in contact therewith may absorb a larger portion of the caloric emitted or produced by the combustion of the fuel employed, likewise by preventing the escape of any considerable portion of such caloric so long as the intensity or temperature of the same may be usefully applied for the purpose of generating steam; and, lastly, by certain contrivances for rarifying, expanding, or enlarging the volume of such steam after it has been so produced. These objects I effect in the following manner:—Fig. 1 represents the elevation of my said new and improved boiler or apparatus in section; the letters A, A, A, A, Fig. 4, shew the outside cylinder or case, which is made of wrought iron or copper, or of any suitable material; in this cylinder or case is placed the fire-place B, Fig. 1; this is open in front, with doors R and S, Fig. 4, joined to the external cylinder or case A, A, A, A, in which an aperture corresponding with the mouth or open space of the fire-place B is left. C, C, Fig. 1, shews the fire bars which divide the fire-place into two equal compartments, the lower one being the ash pit; the fire-place B is so placed in the external cylinder or case A, A, A, A, that the water contained therein may be in contact with the top, bottom, end, and sides of the said fire-place B, as shewn in the section, Fig. 1, and in the ground plan, Fig. 2; the bottom of the external cylinder or case A, A, A, A, is closed by a plate bolted or rivetted thereto, and there is a

man-hole or aperture T, Fig. 4, left near the bottom of the external cylinder or case A, A, A, A, for cleaning out the said apparatus, when required, and which is closed in the usual manner; the top plate B, B, B, B, Fig. 2, of the fire-place B, Fig. 1 and 2, is perforated with a sufficient number of circular holes, which I recommend shall not exceed $2\frac{1}{4}$ inches diameter, the centre hole to be left larger, say 6 inches diameter, as shewn in the ground plan, Fig. 2; into these holes are inserted an equal number of thin copper or other metallic tubes or pipes, as shewn in the section, Fig, 1, and marked D, D, D, D, &c.; these terminate and are inserted in the circular metallic plate E, E, Fig. 1, at top, and which is perforated with a corresponding number of apertures or holes; the plate E, E, Fig. 1, is surmounted by the copper or other metallic dome F, F, Fig. 1, from which three or more elbow pipes, as shewn by G, G, Fig. 1, project, and are connected to the descending pipes or tubes H, H, Fig. 1, which pass through the bottom of the external cylinder or case A, A, A, A, Fig. 1 and 2, the said bottom being elevated about 6 inches on brick-work, or on a cast-iron bed, as shewn by I, I, Fig. 1 and 4, and which is closed on all sides except at the flue K, Fig. 1 and 4; the water in the said apparatus A, A, A, A, Fig. 1, is maintained to the height marked L, L, Fig. 1, so that the dome F, F, and all the pipes or tubes already described, continue immersed therein; through the interior of these pipes or tubes the draught passes or the flame, heated air, or gases ascends through the small pipes D, D, D, D, &c., Fig. 1, to the dome F, F, thence through the elbow pipes G, G, descending through the pipes H, H, to the bottom of the apparatus, where the draught passes off through the flue K to a stack or chimney, if required; the course of such draught is shewn by arrows in the section, Fig. 1; the number and capacity or area of the said tubes or pipes must in all cases bear a proportion to the extent of draught required, and their total external surface should not be less than four square feet for generating steam for each horse power, if applied to condensing engines, and one-half of such proportion for high pressure engines. In order to expand, rarify, or increase the volume of the steam after it has been formed in the said apparatus, I cause it to descend through the pipe M, M, Fig. 1, which passes through the top of the dome F, F, Fig. 1, thence through the centre tube, which is made of sufficient diameter for this purpose; the steam pipe M, M, Fig. 1, terminates with the oblate sphere N, Fig. 1, which is placed a short distance above the fire, and from whence the steam so rarified is conveyed by the pipe O, as shewn by the dotted lines in Fig. 4, which then passes through the top of the door frame P, P, Fig. 2 and 4; the centre tube should be at least 2 inches more in diameter than the steam pipe M, M, Fig. 1, so that the flame or heat

may act thereon in ascending through the centre pipe or tube; and the said steam pipe M, M, Fig. 1, with the oblate sphere N, Fig. 1 and 4, should be copper, to avoid rapid ozydizement, and I use my said apparatus either with or without this latter contrivance for rarifying the steam. In order to increase the effect of my said apparatus, I usually employ a mechanical blast or draught for supplying the requisite quantity of atmospheric air for the perfect combustion of the fuel, such as bellows or a fan formed by a number of revolving planes or flyers placed in a spiral case; but as these machines do not form any part of my present Invention or improvement, and are already sufficiently known, any description of them is unnecessary. Where I apply such mechanical means for producing the required blast or draught, I cause the same to enter through the aperture Q, Fig. 4, into the ash pit, which is furnished with a door R, Fig. 4. This door and the fire door S, Fig. 4, must be fitted accurately to the door frame P, P, Fig. 1 and 4, to prevent the escape of the air so forced in, and when I employ such mechanical blast I check the exit of the heated air or gases by contracting the flue K, Fig. 1 and 4, by means of a damper, so that the heat shall act with greater effect on the metallic surfaces in contact therewith. Fig. 3 represents one of the tubes or pipes D, D, shewn in Fig. 1. U, U, Fig. 3, are collars at each end; they are united to the top and bottom planks either by brazing, revitting, or any other well-known method. Fig. 4 represents an elevation of my said new and improved boiler or apparatus, which is supplied with water by a force pump in the usual manner, and it is furnished with safety valves, guage, cocks, and water float, which, being the common appendages to steam boilers, do not require any description. The scale, Fig. 5, attached to the Drawings, will furnish the relative proportions. Though I have given these Drawings as an exemplification of my improved apparatus for producing steam, yet I do not confine myself to any particular form in the manufacture of my said apparatus, but make them and the smaller tubes or pipes either square, oblong, eliptical, cylindrical, or any other shape and of any suitable materials; and in some cases I vary the position and arrangement of the small metallic tubes or pipes, and place them in an horizontal or oblique position, particularly where altitude of such apparatus should be found inconvenient.

In witness whereof, I, the said James Neville, have hereunto set my hand and seal, this Twelfth day of September, in the year of our Lord One thousand eight hundred and twenty-six.

JAMES (L.S.) NEVILLE.

A.D. 1826. March 16. N° 5344.
NEVILLE'S Specification

[1 SHEET]

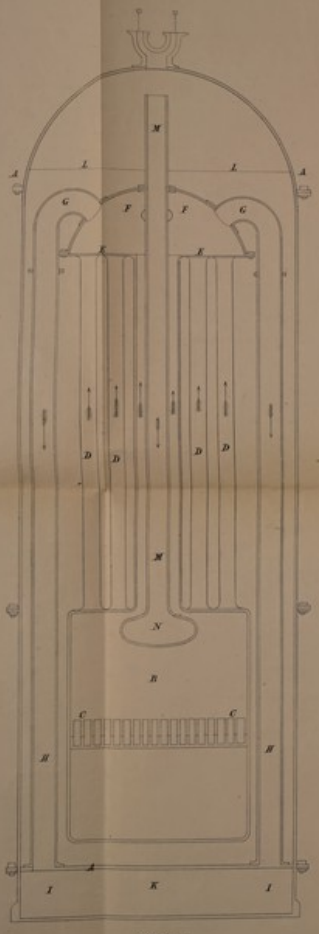

FIGURE 1.

FIGURE 3.

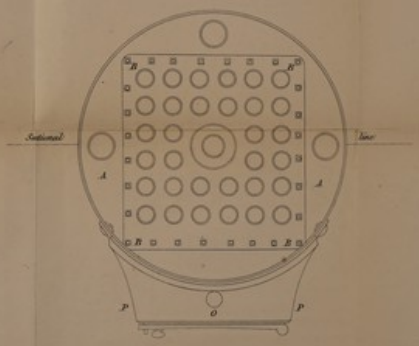

FIGURE 2.

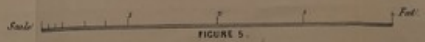

FIGURE 5.

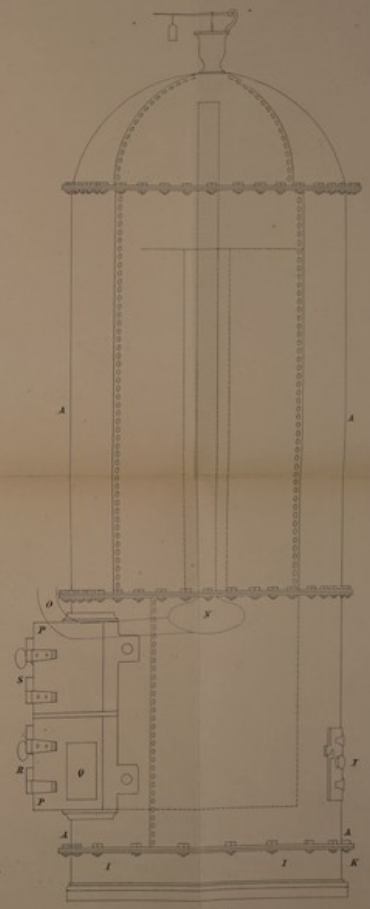

FIGURE 4.

The enrolled drawing is partly colored.

Kelly & Sons, Lithe.

London: Printed by George Edward Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty. 1826.

AND BE IT REMEMBERED, that on the same Twelfth day of September, in the year above mentioned, the aforesaid James Neville came before our Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and everything therein contained, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute in that case made and provided.

Inrolled the same Twelfth day of September, in the year above written.

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1854.