Specification of John Braithwaite and John Ericsson : furnaces of steam boilers and pneumatic apparatus for creating atmospheric draught therein.

Contributors

Braithwaite, John.
Ericsson, John.

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A.D. 1829 . . . . . N° 5763.

SPECIFICATION

OF

JOHN BRAITHWAITE

AND

JOHN ERICSSON.

FURNACES OF STEAM BOILERS AND PNEUMATIC APPARATUS FOR CREATING ATMOSPHERIC DRAUGHT THEREIN.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
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1854.

A.D. 1829 . . . . . N° 5763.

Furnaces of Steam Boilers and Pneumatic Apparatus for Creating Atmospheric Draught therein.

BRAITHWAITE AND ERICSSON'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, we, JOHN BRAITHWAITE and JOHN ERICSSON, of the New Road, Fitzroy Square, in the County of Middlesex, Engineers, send greeting.

WHEREAS His present most Excellent Majesty King George the Fourth, by His Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Thirty-first day of January, in the tenth year of His reign, did, for Himself, His heirs, and successors, give and grant unto us, the said John Braithwaite and John Ericsson, His special licence that we, the said John Braithwaite and John Ericsson, our executors, administrators, and assigns, or such others as we, the said John Braithwaite and John Ericsson, our executors, administrators, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick upon Tweed, and also in all His said Majesty's Colonies and Plantations abroad, our Invention of "A MODE OR METHOD OF CONVERTING LIQUIDS INTO VAPOUR OR STEAM;" in which said Letters Patent is contained a proviso obliging us, or one of us, the said John Braithwaite and John Ericsson, by an instrument in writing under our or one of our hands and seals, particularly to describe and ascertain the nature of our said Invention, and in what manner the same is to be performed, and cause the same to be enrolled in His said Majesty's High Court of Chancery within

six 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 and at large appear.

NOW KNOW YE, that, in compliance with the said proviso, we, the said John Braithwaite and John Ericsson, do hereby declare the nature of our said Invention to consist in generating steam in a boiler wherein the capacity of the flue is too small to allow a sufficient quantity of heated air to pass through it in a given time, by the mere agency of what is commonly called atmospheric draught, and to which flue, therefore, we attach either an air forcing apparatus at the furnace end, or an air exhausting apparatus at the other end of the flue, in order, by these mechanical means, to compel the required quantity of heated air to pass through the flue in a given time, whereby we are enabled to expose a given surface of flue to such a quantity of caloric in a given time as will generate more steam than has ever before been produced in an apparatus of equal capacity, and thus effect a great saving in fuel, and greatly diminish the size and weight of a boiler. And in further compliance with the said proviso, we, the said John Braithwaite and John Ericsson, do hereby describe the manner in which our said Invention is to be performed by the following description thereof, reference being had to the Drawing annexed, and to the figures and letters marked thereon (that is to say):—

Description of the Drawing.

Figure 1 is a sextion of a boiler for generating steam according to the method which we claim as our Invention, and through the flue of which the heated air is drawn by means of an air exhausting apparatus, which apparatus, for the purposes of this Invention, we call an air suction pump. A, A, A, is the outer casing of the boiler. B is the safety valve, and C the steam pipe; D is the furnace; E, one of the furnace bars; F, the ash pit; G, the furnace door; H, H, H, three air cocks, to admit atmospheric air to the top of the fuel in the furnace; J, an air cock to admit atmospheric air to the bottom of the said fuel; K, K, K, K, the flue, gradually diminishing in diameter from the furnace in proportion as the heated air, cooling in its passage through the flue, gradually requires less vent, while another advantage of this form is, that the dust and dirt from the furnace has a constantly descending passage to escape at, which, together with the relative position of the different lengths of the flue being immediately under each other, prevents any inconvenience from dirt collecting in it. L is a double action air exhausting pump, which we call the air suction pump, and it is evident that if this pump be worked, any given quantity of heated air may be drawn through the flue from the furnace in any

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BRAITHWAITE & ERICSSON'S SPECIFICATION

(1. SHEET)

FIG. 2.

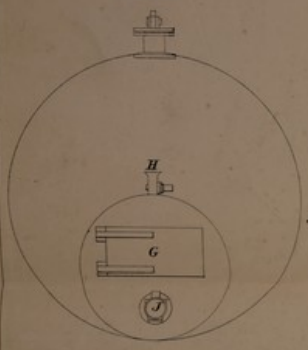


FIG. 1.

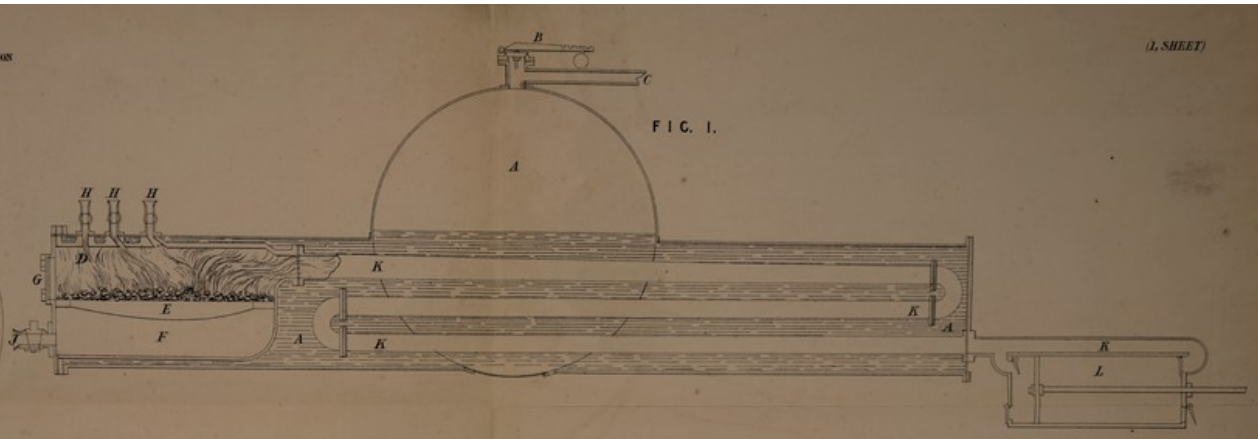
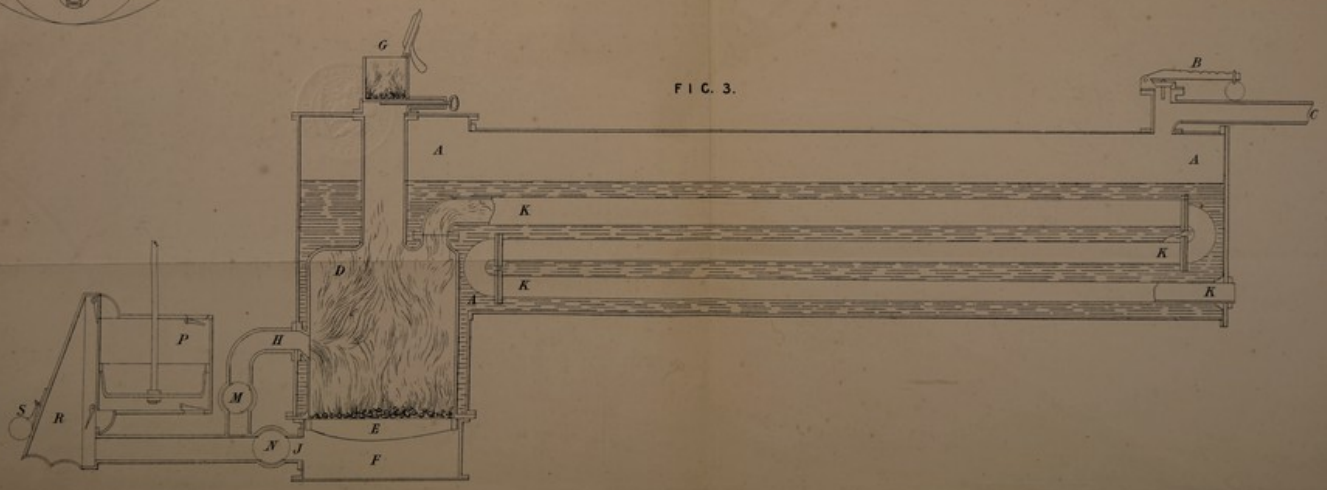


FIG. 3.



The unrolled drawing is partly colored.

Malby & Sons, Lith.

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given time proportioned to the action of the pump, the number or size of the air cocks, and the general dimensions of the apparatus. Figure 2 is an end elevation of the boiler just described. Figure 3 is a section of a boiler for generating steam according to the method which we claim as our Invention, and through the flue of which the heated air is forced by means of an air forcing apparatus, which apparatus, for the purposes of this Invention, we call an air forcing pump. A, A, A, A, is the outer casing of the boiler; B, the safety valve; C, the steam pipe; D, the furnace; E, a fire bar; F, the ash pit; G, a hopper for feeding the furnace with fuel; H, an air pipe, furnished with a regulating cock M, through which atmospheric air is forced on to the top of the fuel; and J is another air pipe, also furnished with a regulating cock N, through which atmospheric air is forced to the bottom of the fuel. P is an air forcing apparatus, which we call an air forcing pump, furnished with valves, as here shown, and an air regulator R, being a board inclosed in a leather case, and acted upon by the weight S. It will be evident that this boiler, as far as the principle of our Invention is concerned, will produce the same effect in generating steam as that first described, the difference in them being merely in the mode of obtaining the required velocity for the heated air in its passage through the flue; but it is worthy of remark that the modifications necessary to the adaptation of the principal of our said Invention to those two forms of boilers renders them respectively the better available for different purposes. In Figure 1 it will be observed that the furnace is horizontally placed, and may be fed from a door in front, as at G, in the ordinary way, while in Figure 3 the furnace is vertically placed, and must be fed from a hopper, as shewn in the Drawing.

Now whereas we claim as our Invention the converting of liquids into vapor or steam by means of a boiler, wherein the capacity of the flue is too small to allow a sufficient quantity of heated air to pass through it in a given time by the mere agency of what is commonly called atmospheric draught, and to which, therefore, either an air exhausting apparatus, or the air forcing apparatus herein-before described, is applied for that purpose, it being our intention to claim as new the application of an air exhausting apparatus generally for such purpose, and the particular air forcing apparatus herein-before described, whereby, as well as in the air exhausting apparatus, the fuel is supplied with air both above and below, as shown in the Drawing annexed, which double supply of air, regulated by cocks as aforesaid, we claim also as new; and such our Invention being, to the best of our knowledge and belief, entirely new, and never before used within that part of His said Majesty's United Kingdom of Great Britain and Ireland called England, His said Dominion of Wales, or

Town of Berwick upon Tweed, nor in any of His said Colonies and Plantations abroad, we do hereby declare this to be our Specification of the same, and that we do verily believe that this our said Specification doth comply in all respects fully and without reserve or disguise with the proviso in the said herein-before in part recited Letters Patent contained. Wherefore we hereby claim to maintain exclusive right and privilege to our said Invention.

In witness whereof, we, the said John Braithwaite and John Ericsson, have hereunto set our hands and seals, this Thirtieth day of July, in the year of our Lord One thousand eight hundred and twenty-nine.

JN°. BRAITHWAITE. (L.S.)
J. ERICSSON. (L.S.)

AND BE IT REMEMBERED, that on the Thirtieth day of July, in the year of our Lord 1829, the aforesaid John Braithwaite and John Ericsson, 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.

Cross.

Inrolled the Thirty-first day of July, in the year of our Lord One thousand eight hundred and twenty-nine.

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