

Specification of Richard Coad : apparatus applicable to furnaces, for consuming smoke and economizing fuel.

Contributors

Coad, Richard.

Publication/Creation

London : Queen's Printing Office, 1854 (London : George E. Eyre and William Spottiswoode)

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A.D. 1835 N^o 6858.

SPECIFICATION

OF

RICHARD COAD.

APPARATUS, APPLICABLE TO FURNACES,
FOR CONSUMING SMOKE AND
ECONOMIZING FUEL.

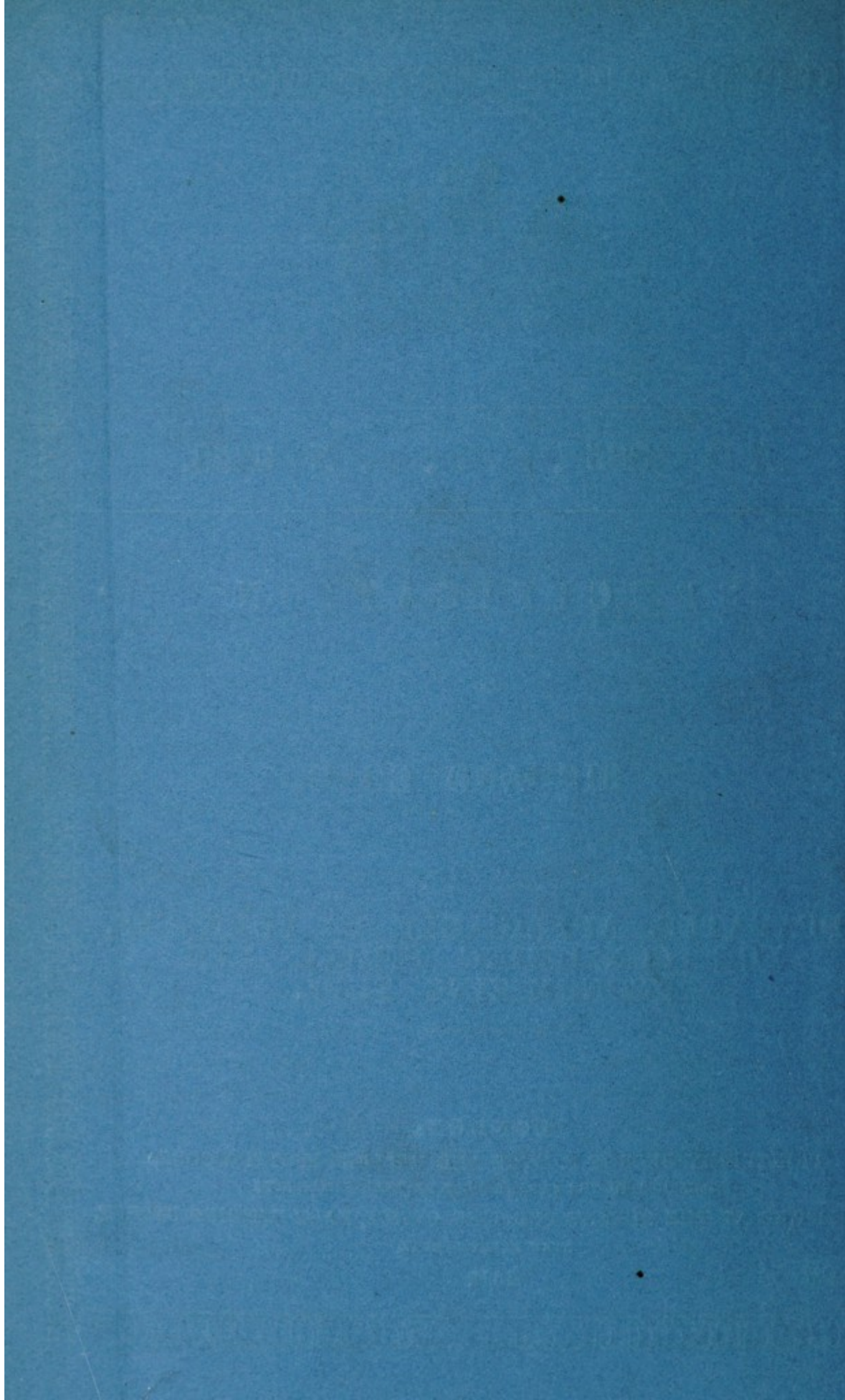
LONDON:

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 8d.

1854.





A.D. 1835 N° 6858.

**Apparatus, applicable to Furnaces, for Consuming
Smoke and Economizing Fuel.**

COAD'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, RICHARD COAD, of Liverpool, in the County of Lancaster, Manufacturing Chemist, send greeting.

WHEREAS His present most Excellent Majesty King William the Fourth,
5 by His Royal Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Tenth day of July, in the year of our Lord One thousand eight hundred and thirty-five, and in the sixth year of His reign, did, for Himself, His heirs and successors, give and grant unto me, the said Richard Coad, His especial licence, full power, sole privilege and authority, that
10 I, the said Richard Coad, my executors, administrators, and assigns, or such others as I, the said Richard Coad, my 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-
15 upon-Tweed, my Invention of "CERTAIN IMPROVEMENTS IN THE MEANS OR APPARATUS FOR CONSUMING SMOKE AND ECONOMIZING FUEL IN FURNACES, WHICH IMPROVEMENTS ARE PARTICULARLY APPLICABLE TO FURNACES OF STEAM ENGINES EMPLOYED FOR NAVIGATION AND OTHER PURPOSES;" in which said Letters Patent is contained a proviso, obliging me, the said Richard Coad, by an instrument in
20 writing under my hand and seal, to cause a particular description of the nature of my said Invention, and in what manner the same is to be performed, to be inrolled in His Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in part recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at
25 large appear.

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NOW KNOW YE, that in compliance with the said proviso, I, the said Richard Coad, do hereby declare that the nature of my said Invention, and in what manner the same is to be performed, is particularly described and ascertained in and by the following description thereof, reference being had to the Drawings, and to the letters and figures marked thereon (that is to say):— 5

My Invention of Certain Improvements in the Means or Apparatus for Consuming Smoke and Economizing Fuel in Furnaces, which Improvements are particularly applicable to Furnaces of Steam Engines employed for Navigation and other Purposes," has for its object a more perfect combustion of the inflammable gases and unconsumed particles of carbon, which in the ordinary 10 construction of flues pass up the chimney in the form of smoke. This Invention consists in arresting or regaining a portion of the heat from the vapours emitted from the combustion of fuel in the furnace during their passage up the chimney, by an apparatus placed in a part of the flues or chimney beyond the boiler, and bringing back a portion of the heat (which would otherwise be wasted or lost), 15 by means of currents of fresh atmospheric air, and introducing the same below the boiler at or near the bridge of the furnace, for the purpose of consuming the smoke. The apparatus which I propose to employ consists of air pipes, tubes, or an air chamber or chambers, placed in or beyond the flue or flues of the boiler or in the chimney, in such a manner as not to interrupt or interfere 20 with the draught; or the said air pipes or tubes may be placed in a chamber situated intermediately between the boiler and the chimney, the said air pipes being open at one end to the atmosphere, for the admission of currents of fresh air, such currents being induced either by natural or artificial means, the other end thereof being open to the furnace at the bridge, as herein-before 25 mentioned. By these means the fresh air becomes heated in its passage through the said pipes, tubes, or chambers by the heated vapours proceeding through the said chamber, flues, or chimney from the fire-place. In order that my Invention may be better understood, I have hereunto annexed several Diagrams or Drawings, by way of illustrating the same, and shewing how the said Invention 3 may be carried into effect; but it is obvious that the principle on which my improvements are founded admits of considerable variation in the modifications of apparatus capable of producing similar effects. I am aware that many plans for consuming smoke and effecting the more perfect combustion of fuel, and also for supplying heated air to furnaces, have been brought into operation; 3 for instance, currents of heated air have before been conducted to the bridge of the furnace and directed upon the burning fuel or gases arising therefrom, but such air has been heated in a chamber by a separate fire, or by the furnace or flues of the boiler, by which means the boiler has been injuriously deprived of

FIG. 1.

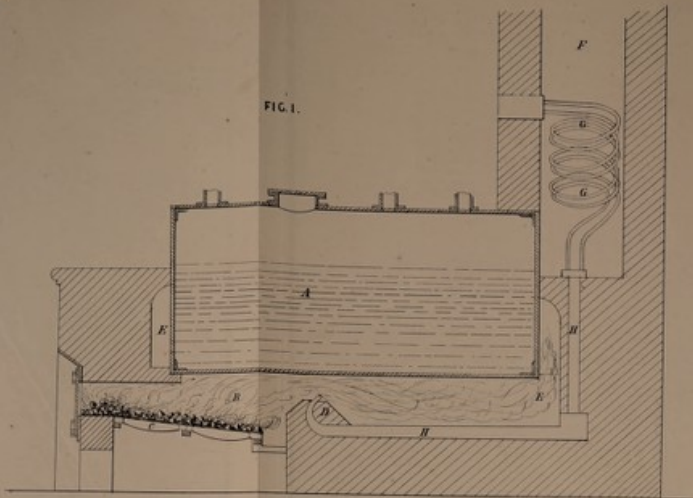


FIG. 2.

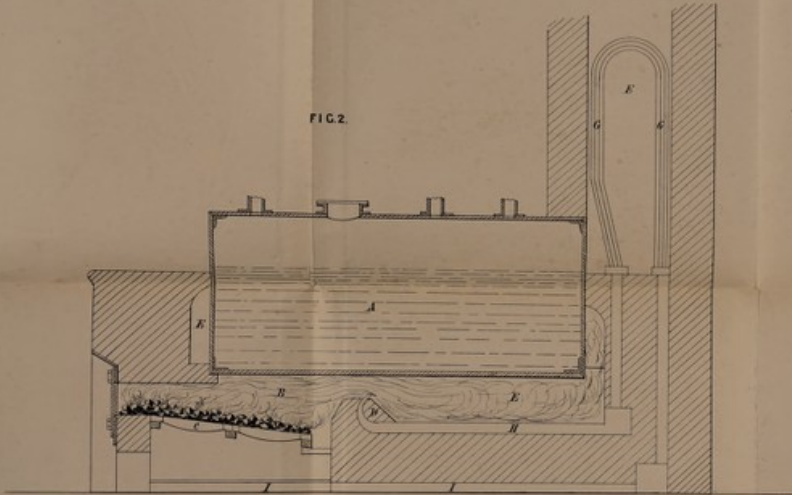


FIG. 3.

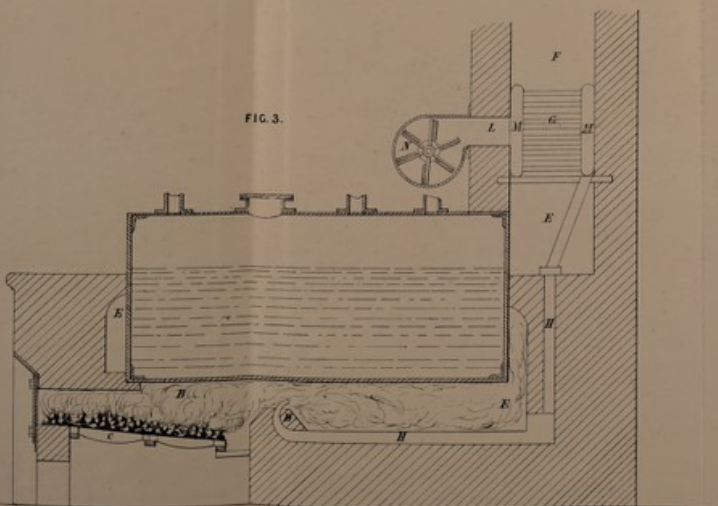
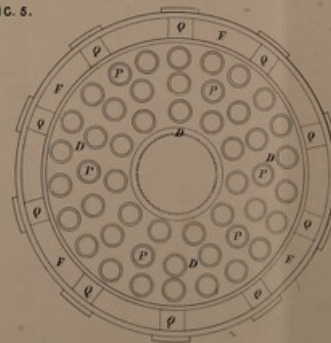


FIG. 4.

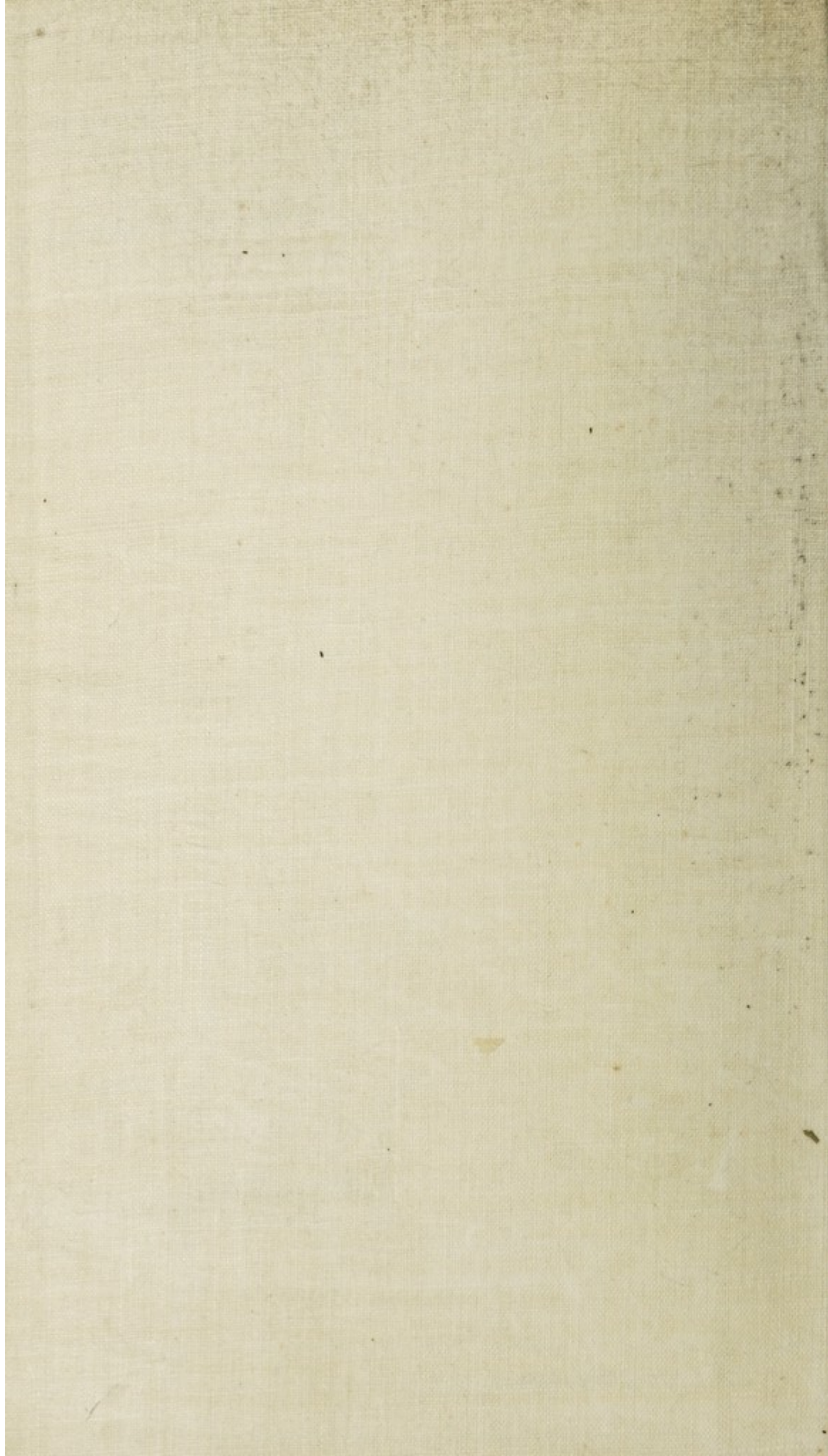


FIG. 5.



The encolled drawing is colored.

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heat by such operation. There have also been plans proposed for abstracting the waste heat from the exit vapours during their passage up the chimney by means of currents of fresh atmospheric air proceeding along pipes placed within the chimney, but the air so heated and abstracted has been employed or
5 intended to be employed exclusively for supporting the combustion of the fuel in the surface by introducing it into an enclosed ash pit, and passing it upward into the furnace through or between the fire bars; whereas my Invention consists in abstracting the waste heat or caloric from the vapours escaping up the flues or chimney, by means of currents of fresh atmospheric air, made to
10 pass through pipes or chambers placed in or in connection with such flues or chimnies, and directing the said fresh atmospheric air so heated and obtained on to the uninflamed smoke or gases arising from the combustion of the fuel at or near the situation of the bridge of the furnace, for the purpose of promoting a more perfect combustion of the smoke and inflammable vapours at that point of
15 its egress. Figure 1 is a vertical section of a furnace, boiler, and flues, taken longitudinally, for the purpose of shewing a method of carrying my said Invention into effect by means of coiled pipes placed in the chimney, which pipes are open at one end to the atmosphere, and at the other end to the interior of the furnace, at or near the top of the bridge. A is the boiler; B, the fire-place or
20 furnace; C, the fire bars; D, the bridge; E, E, the flues; F, the chimney; G, G, a series of pipes or tubes, of iron or other suitable metal, the outer extremities of which pipes or tubes are passed through the side of the chimney, and are open to the atmosphere. These said pipes should in every case have such a number of coils given to them, and present such a surface to the action of the heated air
25 and gasses passing up the chimney, as would render them capable of absorbing the available heat. The lower extremities of the said pipes lead into a larger tube H, H, which forms a passage to the bridge D, and there terminates in a long narrow slot or opening, or a series of small openings, at or near the top of the bridge, so as to direct a current of fresh air upon the uninflamed smoke,
30 where, by means of this current of fresh heated air, a more perfect combustion of the smoke is effected. In cases where the draught of the chimney is not sufficiently strong to induce the required current of atmospheric air to pass through the said pipes, so as to enable the smoke to be effectually consumed, I employ a wind fan or other mechanical means for forcing a proper quantity of air through
35 the said pipes. Figure 2 shews another method of carrying my said Invention into effect, in which a series of bent pipes G, G, are placed nearly vertically in the chimney, instead of in coils, as represented in Figure 1. The outer ends of the pipes G, in this instance, are open to a chamber I, I, under the ash pit, where the air will receive a partial warmth before it enters the pipes G.

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The same letters of reference being marked on the corresponding parts in this and the following Figures, as also in Figure 1, no further description will be necessary. Figure 3 shews another mode of effecting the same object by a series of short tubes G, G, placed horizontally across an enlargement of the chimney at its lower part, one end of each of the said tubes communicating 5 with the chamber K, which said chamber is open to the atmosphere by the short pipe L; the other ends of the said short pipes terminate in the chamber M, from which the pipe H descends and passes to the bridge. In the said Figure 3, I have represented the manner of employing a wind fan, which is shewn at N. In adapting my said Invention to the furnaces of steam boilers 10 of marine or locomotive engines, I prefer using a hot air chamber at the lower end of the chimney, as shewn in a sectional elevation at Figure 4, and in a horizontal section at Figure 5, with tubular flues passing through the hot air chamber. F, F, is the chimney or funnel; D, D, a cylindrical chamber introduced into the chimney, resting on brackets; P, P, represent a number of 15 vertical pipes or tubular flues carried through the cylindrical chamber for the passage of the hot vapours and gases from the furnace to the chimney; Q, Q, are short pipes for the admission of atmospheric air into the chamber D, which air, after having become heated by its passage between the pipes P, P, P, within the chamber, proceeds through the larger tube R, which is connected by 20 a cone and socket to the pipe H, and is discharged at the bridge of the furnace for the purpose of inflaming the smoke, as herein-before mentioned.

In witness whereof, I, the said Richard Coad, have hereunto set my hand and seal, this Twenty-third day of December, in the year of our Lord One thousand eight hundred and thirty-five. 25

RICHARD (L.S.) COAD.

AND BE IT REMEMBERED, that on the Fifth day of January, in the sixth year of the reign of His Majesty King William the Fourth, the said Richard Coad came before our said Lord the King in His Chancery, and acknowledged the instrument aforesaid, and all and everything therein con- 30 tained and specified, in form above written. And also the instrument aforesaid was stamped according to the tenor of the Statute made in the fifty-fifth year of the reign of His late Majesty King George the Third.

Inrolled the Ninth day of January, One thousand eight hundred and thirty-six. 35

LONDON:

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