

## **Specification of Thomas Murgatroyd Dean : furnaces of steam and other boilers.**

### **Contributors**

Dean, Thomas Murgatroyd.

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A.D. 1846 . . . . . N° 11,109.

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S P E C I F I C A T I O N

OF

THOMAS MURGATROYD DEAN.

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FURNACES OF STEAM AND OTHER  
BOILERS.

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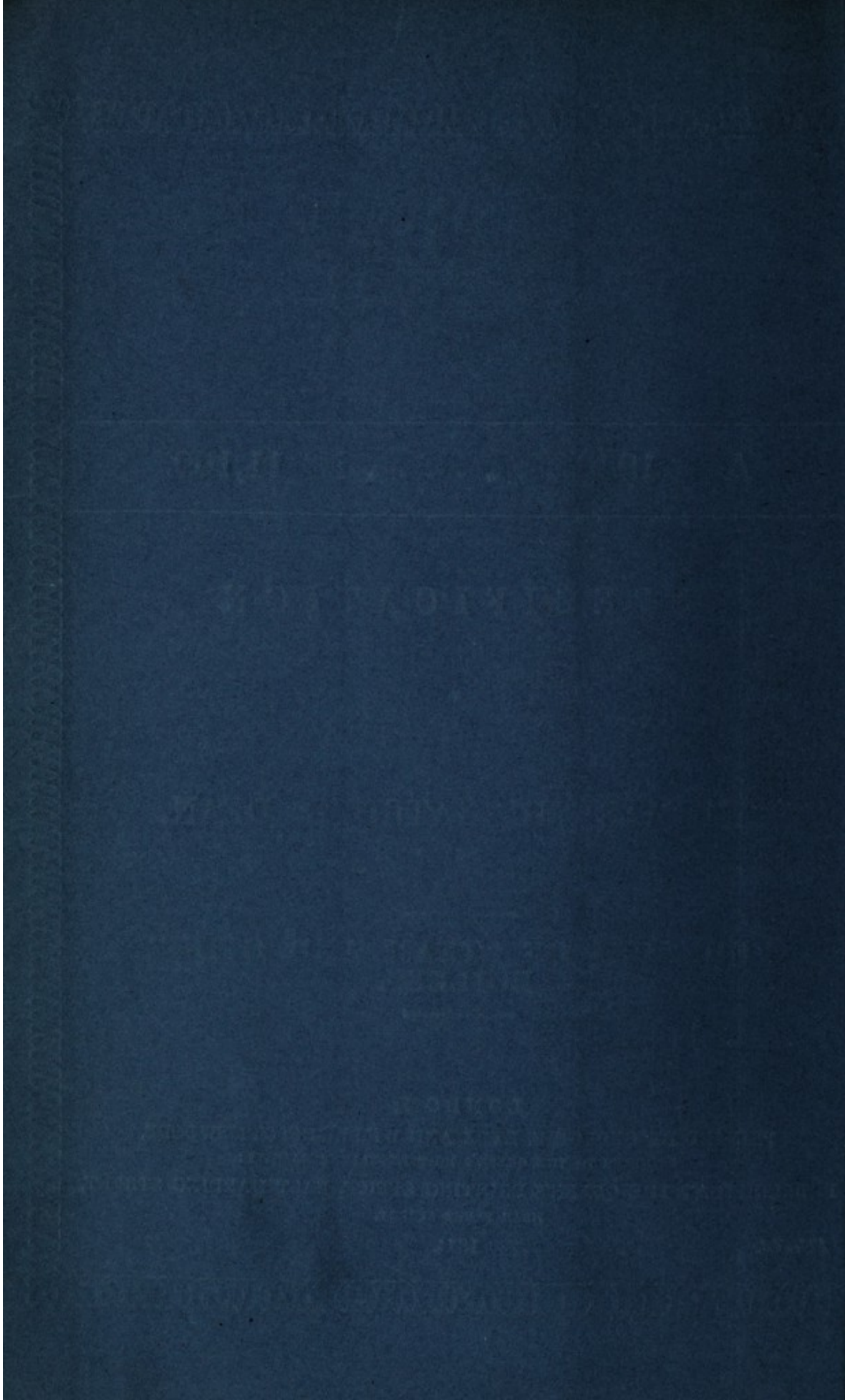
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A.D. 1846 . . . . . N° 11,109.

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**Furnaces of Steam and other Boilers.**

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DEAN'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, THOMAS MURGATROYD DEAN, of Stockport, in the County of Chester, Engineer, send greeting.

WHEREAS Her present most Excellent Majesty Queen Victoria, by Her  
5 Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Twenty-fifth day of February, in the ninth year of Her reign, and in the year of our Lord One thousand eight hundred and forty-six, did, for Herself, Her heirs and successors, give and grant unto me, the said Thomas Murgatroyd Dean, Her especial license, full power, sole privilege and authority,  
10 that I, the said Thomas Murgatroyd Dean, my executors, administrators, and assigns, and such others as I, the said Thomas Murgatroyd Dean, 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  
15 and Wales, and the Town of Berwick-upon-Tweed, my Invention of "CERTAIN IMPROVEMENTS IN MACHINERY OR APPARATUS APPLICABLE TO THE FURNACES OR FIREPLACES OF STEAM ENGINES OR OTHER BOILERS;" in which said Letters Patent is contained a proviso, that I, the said Thomas Murgatroyd Dean, shall cause a particular description of the nature of my said Invention, and in what  
20 manner the same is to be performed, to be inrolled in Her 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 large appear.

*Dean's Improvements in Furnaces or Fire-places of Steam Engines, &c.*

NOW KNOW YE, that in compliance with the said proviso, I, the said Thomas Murgatroyd Dean, do hereby declare that the nature of the said Invention, and the manner in which the same is to be performed, is particularly described and ascertained in and by the Drawings hereto annexed, and the following explanation thereof, that is to say:—

My improvements in machinery or apparatus applicable to the furnaces or fire-places of steam engine or other boilers, have for their object a more perfect consumption of the smoke and other combustible vapours, and consequent economy of fuel; and consist, firstly, in a double, self-acting feeding apparatus, one side of which is caused to supply the furnace with fuel, whilst the other is at rest, and vice versâ, alternately; and secondly, in placing a partition wall in the furnace between the fire doors and the bridge of the same, and employing two dampers at or about the bridge, which are opened and closed alternately by certain levers and rods connected with the feeding apparatus.

And in order more clearly to illustrate the practical application of my Invention, I have attached to these Presents a Sheet of Drawings, shewing my Invention as applied to the furnace of an ordinary cylindrical boiler, the same being drawn to a scale of about half an inch to the foot, and having similar letters of reference placed upon corresponding parts of the apparatus in all the Figures.

Figure 1 is an end view of a steam boiler and furnace with my improvements applied thereto; Figure 2 is a transverse section, taken in front of the bridge of the furnace; and Figure 3 is a horizontal section, taken below the boiler. *a, a*, is the foundation brickwork supporting the boiler *b, b*; *c, c*, is the "dead plate" of the furnace; and *d, d*, are the fire bars; *e* is the main driving shaft, to which motion is communicated by a strap passing around the pulley *e*<sup>1</sup> at its upper end, or by any other convenient means. Upon the main driving shaft *e* is a pulley *f*, which, by means of the cross straps *g* and *h*, drives the shaft *i* of the right-hand feeding apparatus, and the shaft *j* of the left-hand feeding apparatus alternately; the shafts *i* and *j* have each a fast and a loose pulley at their upper end, and the requisite shifting of the straps from the fast on to the loose pulleys is effected in the following manner:—A small crank *k* is caused to revolve by means of a worm on the driving shaft *e*, actuating the worm gearing *l*; this crank *k* has a lever attached to it, furnished with the two studs *m* and *n*, which as the crank revolves causes the strap lever *o* to vibrate, throwing one strap on to the loose pulley and the other on to the fast one, thus alternately setting in motion and stopping each feeding apparatus. It will be seen in Figures 2 and 3 that there is a partition wall *p* in

FIG. 1.

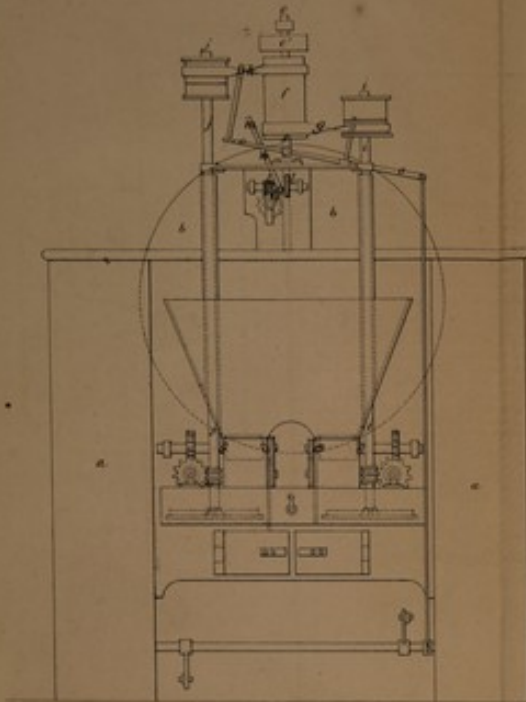


FIG. 2.

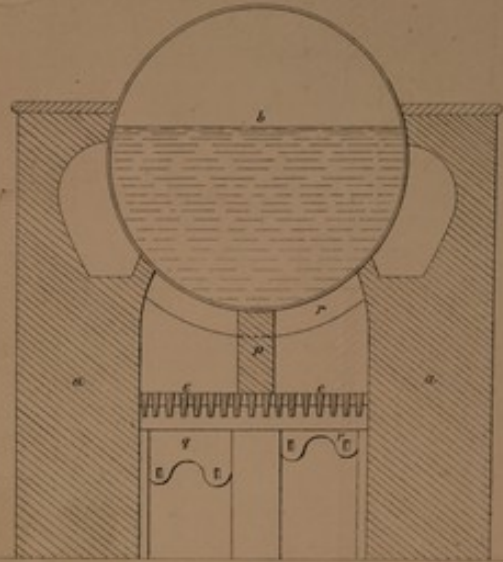
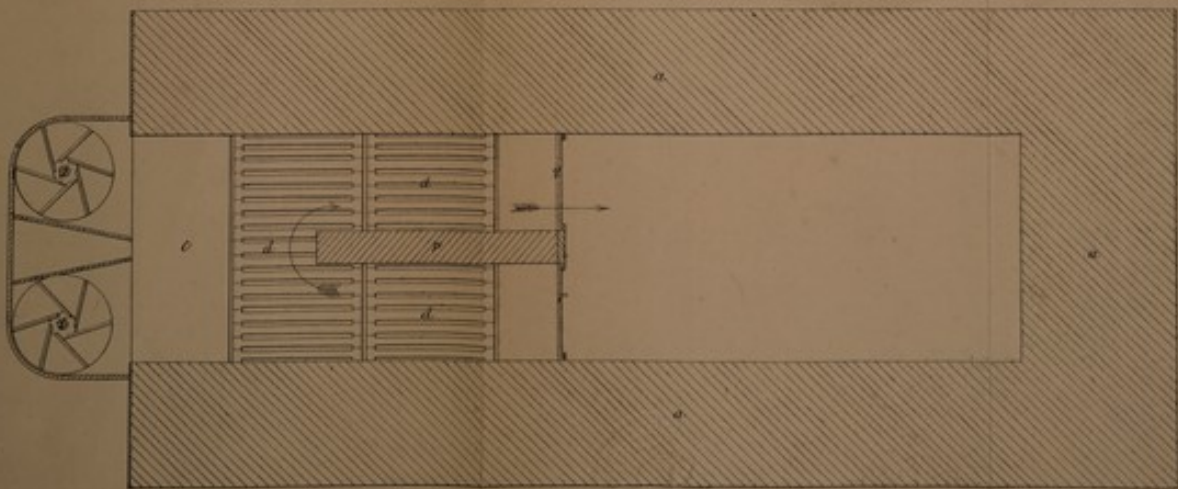


FIG. 3.





*Dean's Improvements in Furnaces or Fire-places of Steam Engines, &c.*

the furnace, reaching from the fire bars to the bottom of the boiler, and extending from the bridge about half way to the fire doors, and that there are two dampers *q* and *r* behind the bridge of the same, one of which is open and the other closed. These dampers are connected to the strap  
 5 lever *o* by cranks and levers, so that when one side of the feeding apparatus is supplying fuel to the fire, the damper upon that side is closed, and the damper upon the opposite side is open, and vice versâ. In the Drawing the right-hand feeding apparatus is represented at work, and that upon the left hand stationary; so the right-hand damper being closed, the  
 10 smoke, &c. from the fresh coal will have to pass round the partition wall *p*, and over the fire upon the left hand of the furnace, and will thereby be consumed; of course it will be evident that when the motion of the feeding apparatus and dampers is reversed by the revolution of the crank *k*, the passage of the smoke, &c. will be reversed also.

15 In witness whereof, I, the said Thomas Murgatroyd Dean, have hereunto set my hand and seal, this Twenty-fourth day of August, One thousand eight hundred and forty-six.

THOMAS MURGATROYD (L.S.) DEAN.

AND BE IT REMEMBERED, that on the same Twenty-fourth day of  
 20 August, in the year above mentioned, the aforesaid Thomas Murgatroyd Dean came before our Lady the Queen in Her 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.

25 Inrolled the Twenty-fifth day of August, in the year above written.

EDWARD ASTON, a Master  
 Extraordinary in Chancery.

LONDON :

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



