Specification of Donald Bethune : apparatus for preventing or consuming smoke in furnaces and chimneys.

Contributors

Bethune, Donald.

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A.D. 1857 . . . . . N° 1601.

SPECIFICATION

OF

DONALD BETHUNE.

APPARATUS FOR PREVENTING OR CONSUMING SMOKE IN FURNACES AND CHIMNEYS.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
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1857.

A.D 1857 . . . . . N° 1601.

Apparatus for Preventing or Consuming Smoke in Furnaces and Chimneys.

LETTERS PATENT to Donald Bethune, of Cambridge Terrace, Hyde Park, London, Esquire, for the Invention of "IMPROVEMENTS IN APPARATUS FOR PREVENTING OR CONSUMING SMOKE IN FURNACES AND CHIMNIES."

Sealed the 8th December 1857, and dated the 8th June 1857.

PROVISIONAL SPECIFICATION left by the said Donald Bethune at the Office of the Commissioners of Patents, with his Petition, on the 8th June 1857.

I, DONALD BETHUNE, of Cambridge Terrace, Hyde Park, London, Esquire, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN APPARATUS FOR PREVENTING OR CONSUMING SMOKE IN FURNACES AND CHIMNIES," to be as follows:—

My said Invention consists in improvements in apparatus for the admission of air into the flues of furnaces, boilers, and chimnies, by which improvements such apparatus is made self-acting, and the smoke is consumed without such attention on the part of the stoker as is now required, and the air necessary for the consumption of the smoke is admitted into the flues or chimnies by the self-acting apparatus when required, and shut off when no longer necessary. For this purpose, I employ a cylindrical or other shaped vessel, and by means of water or other fluid I regulate the supply of air to the flues or furnaces,

and I admit the air into the flues or furnaces either at the doors or at the back of the bridge, as may be most convenient; or the air may, when necessary, be admitted by the said self-acting apparatus back of the bridge, and at the door of the furnace or flue at the same time.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Donald Bethune in the Great Seal Patent Office on the 8th December 1857.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, DONALD BETHUNE, of Cambridge Terrace, Hyde Park, London, Esquire, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Eighth day of June, in the year of our Lord One thousand eight hundred and fifty-seven, in the twentieth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Donald Bethune, Her special licence that I, the said Donald Bethune, my executors, administrators, and assigns, or such others as I, the said Donald Bethune, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN APPARATUS FOR THE ADMISSION OF AIR INTO THE FLUES OF FURNACES, BOILERS, AND CHIMNIES," upon the condition (amongst others) that I, the said Donald Bethune, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Donald Bethune, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement, reference being had to the accompanying Drawings, and to the letters and figures marked thereon (that is to say) :—

My said Invention consists in "Improvements in Apparatus for the Admission of Air into the Flues of Furnaces, Boilers, and Chimnies," by which improvements such apparatus is made self-acting, and the smoke is

consumed without such attention on the part of the stoker as is now required, and the air necessary for the consumption of the smoke is admitted into the flues or chimnies by the self-acting apparatus when required, and shut off when no longer necessary. For this purpose, I employ a cylindrical or other shaped vessel, and by means of water or other fluid I regulate the supply of air to the flues or furnaces; and I admit the air into the flues or furnaces either at the door, or at the back of the bridge, as may be most convenient; or the air may, when necessary, be admitted by the said self-acting apparatus back of the bridge, and at the door of the furnace or flue at the same time.

Such being the nature of my said Invention, I will proceed to describe by reference to the accompanying Drawings an arrangement of apparatus suitable for carrying my said Invention into practice.

Description of the Drawings.

Figure 1 shews a front view of the apparatus applied for the admission of air through the door of a boiler or furnace; Figure 2 shews the interior of the outer cylinder; Figure 3 shews another description of cylinder for effecting the same object, and which is well known; in Figure 4 is shewn a valve for the admission of air through the dead-plate of a boiler or furnace at or near the door, and which is closed by the self-acting apparatus in the same manner as the valve which admits the air through the door; Figure 5 shews a view of the apparatus for closing the valve which admits the air at the back of the bridge; Figure 6 shews the cylinder, and the interior of it. In each of these Figures the same letters of reference indicate the same parts.

A is the furnace front; B, the furnace door; C, the valve or lid for admitting the air into the furnace, and which shuts off the air on being closed; D, the cylinder, which regulates the speed of closing the lid or valve of the door; E, the interior of the cylinder; F, the beam connected with the cylinder, and with the lid or valve of the door; G, the stud upon which the beam works; H, a double joint connecting the beam with the connecting rod to the inner cylinder; I, the chain connecting the beam with the lid or valve of the door; K, the rods connecting the lid in Figure 4 with the cylinder; L, the grate bars in Figure 4; M, the oscillating lever for opening and closing the valve in Figure 5; N, a pulley, round which the chain traverses which connects the valve or lid in Figure 5 with the oscillating lever, which lever is secured by a stud P to the boiler; O is the piston rod, with a screw at the upper end, and with a conical lower end, for regulating the passage of water through the piston; R is a piece of iron about three-eighths of an inch thick, secured to the sides of the inner cylinder, through which the upper end of the piston rod

passes, and contains a screw corresponding with that upon the piston rod, so that the rod may be elevated or depressed at pleasure. The piston may be of cast iron, or other metal, about half an inch thick, and about two inches deep, with a boss nearly two inches deep for the piston rod with the conical end to pass through so far as the conical end will permit. The diameter of the inner cylinder may be about an inch less than that of the outer one. Water is put into both cylinders until it reaches about an inch above the perforated holes shewn in the inner cylinder, which serves the purpose of a valve. There may be a valve in the piston of the inner cylinder, if desired, of india-rubber, or other material. The valve or lid for admitting the air through the door or through the dead plate is attached by hinges to the door or dead plate, and a stud or loop is attached thereto, to which the chain to the beam is fastened. The outer cylinder may be of cast iron, galvanized iron, or other metal; and the inner cylinder may be of galvanized iron or other metal. When the outer cylinder is of light material it should stand upon and be secured to a cast-iron or other heavy foundation, and which may be extended sufficiently high to preserve it from injury. There is a top to the outer cylinder, with a hole in it for the rod connecting the beam with the inner cylinder to work through.

When fuel is put upon the fire, and the door is closed, the stoker raises the beam F, shewn in Figure 1, which opens the lid or valve in the door for the admission of air into the furnace, and depresses the inner cylinder and piston attached thereto nearly to the bottom of the outer cylinder, and the water in the inner cylinder is allowed to flow out between the conical or lower end of the piston rod and the boss of the piston, and according to the speed at which it flows out so will be the time taken for the closing of the lid or valve of the door. There is a screw at the upper end of the piston rod, and also a screw in the iron through which the rod passes, so that the rod may be screwed up to prevent the passage of water through the piston, or opened at pleasure. In using the apparatus shewn in Figure 4, the stoker, after coaling, presses the connecting rod down into the cylinder, and which opens the lid or valve in the dead plate, and which is closed in the same manner as in Figure 1, by the action of the inner cylinder. The valve or lid in Figure 5 is opened when the door of the furnace is opened for coaling, as the door presses the oscillating lever M back towards the front of the boiler, and which being connected at the upper end of it by a double joint (and which also turns in every direction, and which is well known), raises the beam, and, by throwing out the lower end of the oscillating lever, opens the lid or valve at the split bridge. The lid or valve is then closed by the action of the inner cylinder, as in Figure 1. The cylinder shewn in Figure 3 may be of brass or iron, and is well known. The

piston has a valve in it, which may be of india-rubber, or other material, and as it descends upon raising the beam F, the water in the cylinder passes through the valve to the upper side of the piston ; and as the water can only pass through the tube leading from the upper to the lower part of the cylinder (and which may be more or less closed by the cock T), the closing of the valve or lid may be regulated at pleasure.

Having thus described the nature of my Invention, and the manner in which it is to be performed, I would have it understood that I make no claim to the mechanical parts separately, nor do I confine myself to the details ; but what I do claim is, the combined apparatus herein described applied to the door or other parts of a furnace or boiler, as herein described or mentioned.

In witness whereof, I, the said Donald Bethune, have hereto set my hand and seal, this Eighth day of December, in the year of our Lord One thousand eight hundred and fifty-seven.

D. BETHUNE. (L.S.)

Signed, sealed, and delivered, by the within-named Donal Bethune, in the presence of

JAS RD BURTON,

Clerk to Mr. Warner, Law Stationer,

314J, Oxford Street.

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1857.

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FIG. 4.

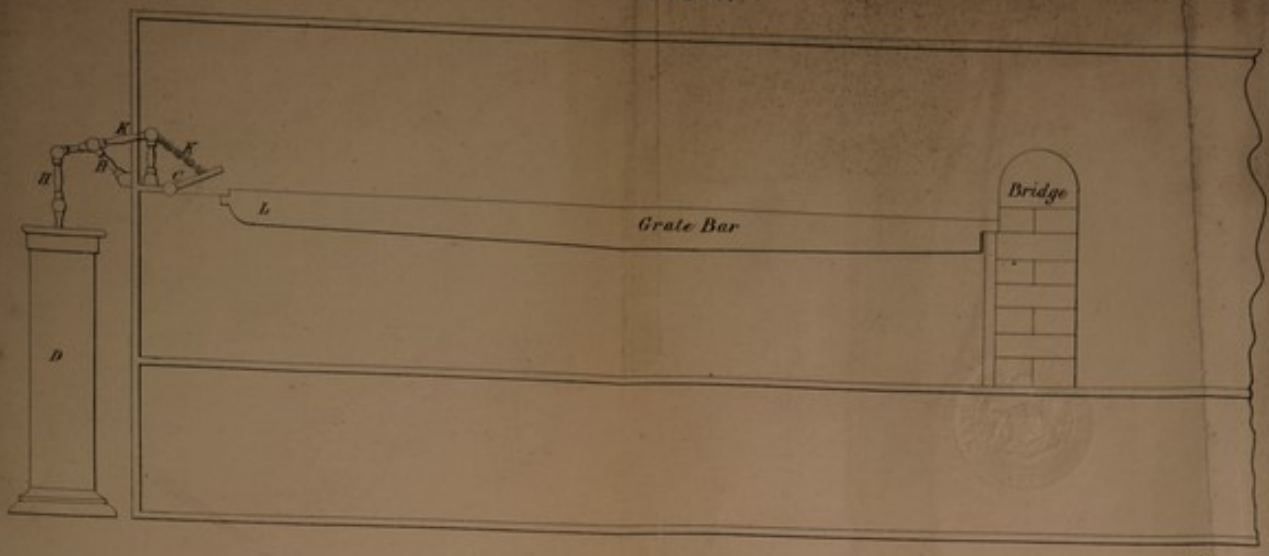


FIG. 5.

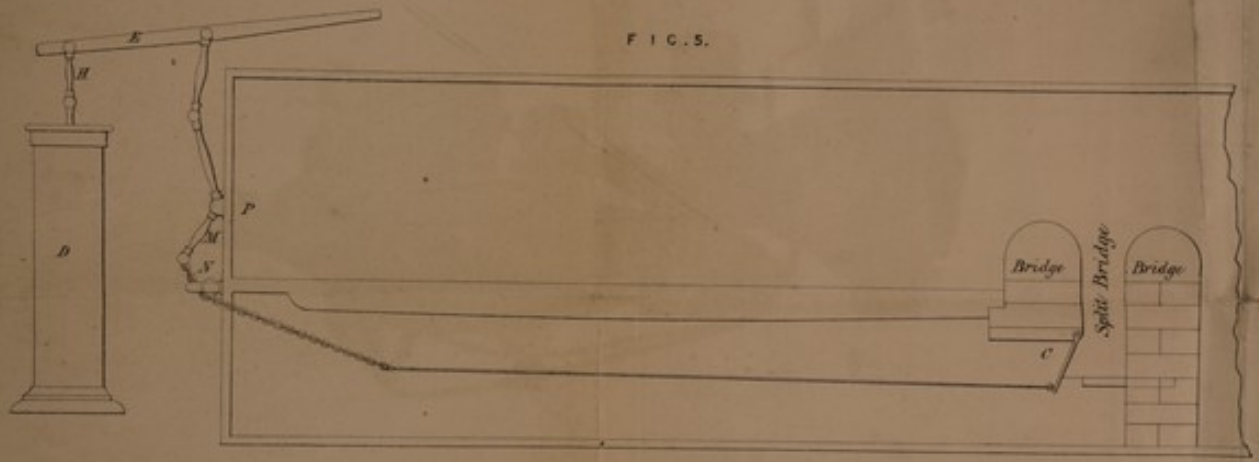


FIG. 3.

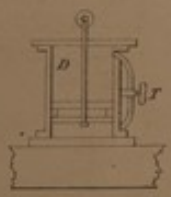


FIG. 1.

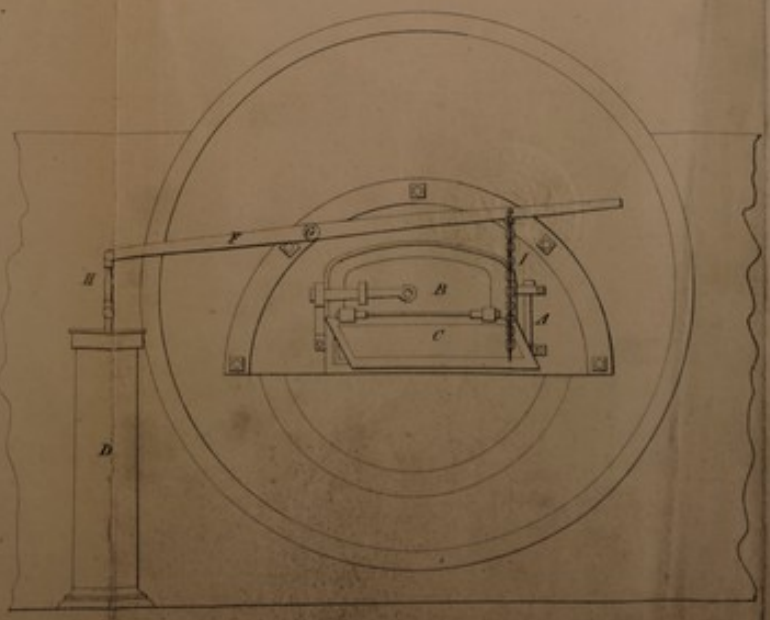


FIG. 6.

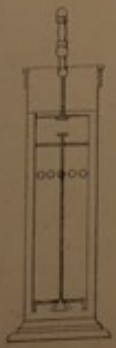
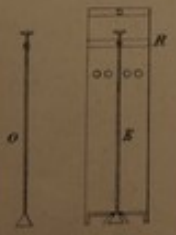


FIG. 2.



The filled drawing is not colored.

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