Specification of Ferdinand Jossa : furnaces and ovens.

A.D. 1857 . . . . . N° 866.

SPECIFICATION

OF

FERDINAND JOSSA.

FURNACES AND OVENS.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
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A.D. 1857 . . . . . N° 866.

Furnaces and Ovens.

LETTERS PATENT to Ferdinand Jossa, of St. Helen's Colliery, near Bishops Auckland, in the County of Durham, for the Invention of "IMPROVEMENTS IN FURNACES AND OVENS, FOR THE PREVENTION OF SMOKE AND FOR ECONOMY OF FUEL."

Sealed the 25th September 1857, and dated the 28th March 1857.

PROVISIONAL SPECIFICATION left by the said Ferdinand Jossa at the Office of the Commissioners of Patents, with his Petition, on the 28th March 1857.

I, FERDINAND JOSSA, of St. Helen's Colliery, near Bishops Auckland, in the County of Durham, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN FURNACES AND OVENS, FOR THE PREVENTION OF SMOKE AND FOR ECONOMY OF FUEL," to be as follows:—

This Invention consists of a peculiar arrangement of furnaces, whereby the coal or other fuel is subjected to dry distillation before being consumed, and the gases evolved thereby are brought into economical use without emitting opaque smoke. The principal features of my arrangement are the use of a metal cylinder or shoot at the side of the furnace, into which the fuel is placed and from which an inclined channel is formed, whence the fuel falls partly below the boiler into a fire-proof chamber, where the fuel is subjected to dry

distillation. The gases evolved therefrom are conveyed underneath the boiler and serve to heat it, and the coke will fall through apertures on to the fire bars, where it will be consumed without creating visible smoke.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Ferdinand Jossa in the Great Seal Patent Office on the 28th September 1857.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, FERDINAND JOSSA, of Saint Helens Colliery, near Bishops Auckland, in the County of Durham, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-eighth day of March, in the year of our Lord One thousand eight hundred and fifty-seven, in the twenty-first year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Ferdinand Jossa, Her special licence that I, the said Ferdinand Jossa, my executors, administrators, and assigns, or such others as I, the said Ferdinand Jossa, 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 FURNACES AND OVENS, FOR THE PREVENTION OF SMOKE AND FOR ECONOMY OF FUEL," upon the condition, amongst others, that I, the said Ferdinand Jossa, 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 Ferdinand Jossa, 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:—

This Invention consists of a peculiar arrangement of furnaces, whereby the coal or other fuel is subjected to dry distillation before being consumed, and the gases evolved thereby are brought into economical use, without emitting smoke. The principal features in my arrangement are the use of a metal

cylinder or shoot at the side of the furnace, into which the furl is placed, and from which an inclined channel is formed, whence the fuel falls partly below the boiler on to a fire-proof chamber, when the furl is subjected to dry distillation. The gases evolved therefrom are conveyed under the boiler and serve to heat it, and the coke will fall through apertures on to the fire bars, where it will be consumed without creating visible smoke. A is a receiver shoot or funnel, made of iron, to receive the coals. The fuel falls through the sloping passage B on to a wall built of fire-proof bricks D, which is kept burning hot by the grate applied beneath it. The fuel which covers this heated surface is here subjected to dry distillation, as the access of air is precluded, by means of which the gases escape through the tubes or draughts under the boiler, and leave behind the coke formed by the process. As the gas developement ends firstly among the coals, it is necessary to push forward at certain intervals the coal which lies on the level surface D with the pestle H, so that the coke which is over D falls upon the grate, and fresh coals follow from the shoot. The coke should be spread with a rake over the grate through the door I, where they will be consumed without throwing off smoke. The wall D will be kept burning hot, to facilitate the development of the gases and help to heat the boiler. In order to aid the process of distillation, air may be introduced to the tranversal hollow beam F, which open freely in the brickwork of the boiler or furnace, and which freely admit of air uniting with the gases of combustion.

The adjoined Drawing shows the plan of a fire grate, which by a simple construction ensures both a complete consumption and the utmost possible saving of fuel. The arrangement is designed for the fire-place of a simple cylindrical boiler; it may be, however, easily fitted to every fire constructed on bars. It is easily effected and with little expence where the fire rests in front of or under the boiler; should the fire be situated within the boiler it must be removed to the front of the boiler. In the present Drawing the bars which lie in front of and reach under the boiler are six feet long and three feet wide; above them, at a height of two feet, is the arch A, B, built of fire bricks, which is contiguous with the fire room above. Between the bars and this upper arch a horizontal arch C, D, is to be erected, which reaches to somewhat about the middle of the bars. Between this arch, which is only half a brick thick, and the upper fire hearth remains in the whole width of the bars, consequently three feet, an open space nine inches in height; this space opens in front in a cleft of seven inches high and three feet long, through which the walls from the reservoir E reach the arch C, D. A fox of plate iron F, which closely fits the aperture in front, being provided with rollers and

lined with fire bricks, serves as a piston to push the coals forward on the arch. When the piston is drawn in the direction of G the coals fall from the reservoir E upon the arch C, D; as the piston again draws into its former position it pushes the coals forward, and throws the live coals nearest to the edge D upon the bars, which then are distributed through the fire door. In fire-places of different dimensions from that given in the present Drawing it is easy to accommodate the respective proportions, but it is always necessary for the bridge C, D, to reach to the middle of the bars, and with very short bars it will be even necessary to build somewhat beyond the middle. This smoke-consuming apparatus can be fitted to all bar furnaces.

There is only this observation to make in regard to boiler fires, puddling furnaces, &c. &c., that in larger fires the height between the bars and the wall must not be reduced to less than fifteen inches. The adjoined plan B, B, which is designed for furnaces where considerable heat is desired, has, in place of the cast-iron bars, channels of fire bricks, which, by means of the damper T, may be shut more or less. These channels are about three inches wide and two inches high, (one brick thick; however, even in other furnaces these channels may be adopted in place of the cast-iron bars. It is to be observed in addition that this apparatus may also be fixed without the reservoir.

For Puddling Furnaces.

For further explanation, a plan of puddling furnace is added. The arch A consists of the best fire bricks; it is slightly arched; the separate stones must be worked with the file, in order to strengthen the arch. An arch being necessary, the upper plane becomes in the middle higher than at the sides; this inequality may be made even by laying over it small pieces of fire bricks with some fire clay, by which means an even plane is obtained. This plane must be covered with a wrought-iron plate, in order to allow the coals to move easier along. Besides this, there is to be fixed in front of the furnace a plate B, having a support, and which serves to receive coals. If desired a reservoir for coals may also be added. The arch must not be built further into the fire room than the distance of the corner (fox) C from the arch D amounts to. The thickness of the arch is four and a half inches (one brick wide), it stands eight inches from the arch of the furnace. The opening for stoking is six inches high by two feet six inches wide; its distance from the corner (fox) is one foot two inches; from the fire grate one foot six inches. G is the opening above, and F the one below.

Having now described the nature of my said Invention, and how the same

is to be performed, I wish it to be understood I do not confine myself to the precise details herein-before described; but what I claim, and desire to secure by these Letters Patent, is, the mode herein-before described and shewn of constructing and of feeding furnaces and grates in order to prevent the emission of smoke.

In witness whereof, I, the said Ferdinand Jossa, have hereunto set my hand and seal, this Twenty-sixth day of September, One thousand eight hundred and fifty-seven.

FERDINAND JOSSA. (L.S.)

LONDON:
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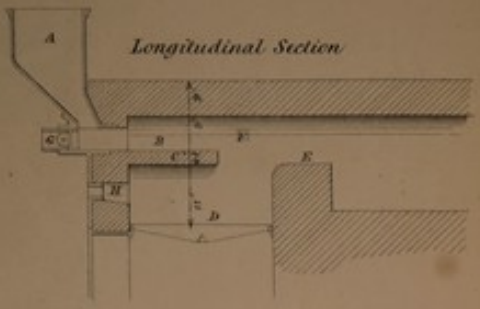
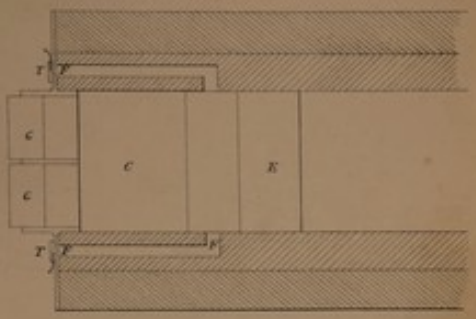
Longitudinal Section

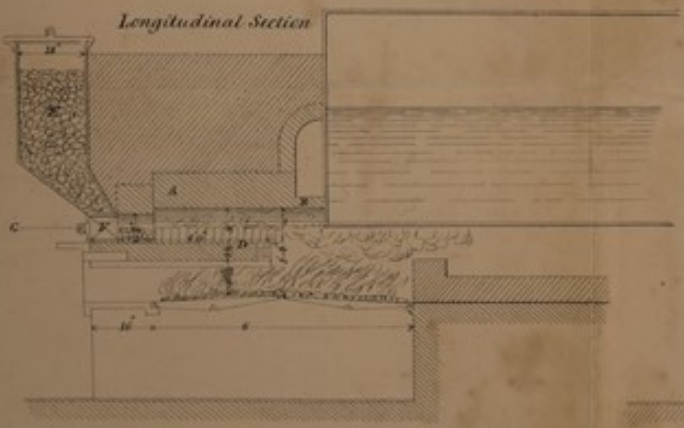


Section.

Ground Plan.



Longitudinal Section



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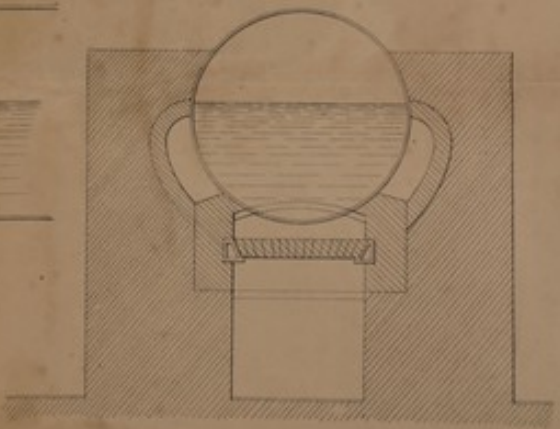
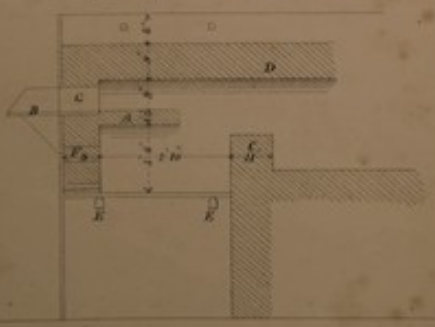


Puddling Furnace

Longitudinal Section.



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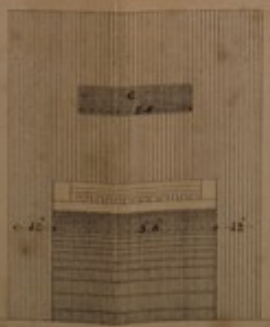
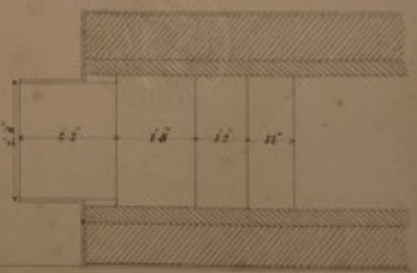
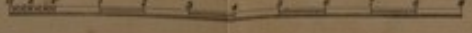


Ground Plan



Scale of Feet.



Tinted drawing is not colored.

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