Specification of Joseph Wass : construction of smelting furnaces.

A.D. 1822 . . . . . N° 4682.

SPECIFICATION

OF

JOSEPH WASS.

CONSTRUCTION OF SMELTING FURNACES.

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Construction of Smelting Furnaces.

WASS'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JOSEPH WASS, of Lea Wharf, in the Parish of Ashover, in the County of Derby, Millwright and Lead Smelter, send greeting.

WHEREAS His most Excellent Majesty King George the Fourth did, by His Letters Patent under the Great Seal of that part of the United Kingdom of Great Britain and Ireland called England, bearing date at Westminster, the Fifteenth day of June, One thousand eight hundred and twenty-two, in the third year of His reign, give and grant unto me, the said Joseph Wass, my exors, admors, and assigns, His especial licence, full power, sole privilege and authority, that I, the said Joseph Wass, my exors, admors, and assigns, during the term of years therein mentioned, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick upon Tweed, my Invention of "AN IMPROVEMENT WHICH PREVENTS THE ILL EFFECTS TO VEGETATION AND ANIMAL LIFE THAT HAS HITHERTO BEEN OCCASIONED BY THE NOXIOUS FUMES AND PARTICLES THAT ARISE FROM SMELTING OR CALCINING LEAD ORE AND OTHER PERNICIOUS MINERALS;" in which said Letters Patent there is contained a proviso that if I, the said Joseph Wass, shall not particularly describe andas certain the nature of my said Invention, and in what manner the same is to be performed, by an instrument in writing under my hand and seal, and cause the same to be inrolled in His Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said Letters Patent, that then the said Letters Patent, and all liberties and advantages whatsoever thereby granted, shall utterly cease, determine, and become void, as in and by the same, relation being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Joseph Wass, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed, are particularly described and ascertained in and by the Drawings hereunto annexed, and the following description thereof (that is to say):—

My improvement for preventing the ill effects upon animal and vegetable life which have hitherto been experienced from the noxious fumes and particles emitted in the smelting or calcining of lead ore and other minerals, consists in an improved mode of consuming the smoke and ventilating the flues of smelting furnaces, by which the heavier particles of the noxious efflusia will be arrested and the lighter parts or mere vapour be conducted into the atmosphere, at a sufficient height and under such circumstances as will cause it to rise and mix with the air, so as to produce no deleterious effects. These objects will be fully accomplished by a contrivance similar to that shewn in the Drawing hereto annexed, in which Fig. 1 is a plan or horizontal section of a building, wherein the site of four lead smelting furnaces are shewn at *a*, *a*, *a*, *a*. In the center of the building the horizontal flues and chimneys *b*, *b*, *b*, *b*, from the several furnaces are intended to meet and pass into a circular tower. Fig. 2 is a vertical section of the tower taken through the middle, and in which two of the smelting furnaces are shewn with their flues and chimneys passing into the tower. In the construction of these furnaces I claim no improvement (except in the introduction of dampers O), but consider the combining of several together to be new. A, A, are the external walls of the tower, which must be lofty and capacious, its suitable dimensions depending upon the number of furnaces and flues intended to be connected thereto. Under the circumstances of four furnaces, as shewn in the plan, its internal diameter may be about thirteen feet, and its height, commencing at the top of the chimney at about thirty-six feet from the ground, not less than twenty-four feet, but higher would answer better. *b*, *b*, as aforesaid, are the flues and chimneys, extending from the smelting furnaces *a*, *a*, and rising up into the central passage at any desired height, as shewn by the dotted lines. It is found that lead smelting furnaces in general consume a great part of their smoke (except at the first igniting, before the furnace has arrived at a smelting heat), but from the powerful draft much of the noxious and pernicious particles have hitherto been found to pass through the flues and chimneys and escape into the air. To prevent this, I have contrived a cap B, which I suspend over the throat C, under which a part of the smoke will be consumed and the heavier particles of the efflusia be impeded in their progress and prevented from passing up the tower. G, G, is the lodge floor, upon which a great portion of the heavy particles deposit themselves, and from whence they

are occasionally collected and conveyed to a wasting furnace. The cap B is suspended by a perpendicular rod D, which passes up the center of the tower; this rod is supported by a sort of stirrup iron E, attached to the beam F, which is placed across the tower. At the upper end of the rod D there is a screw nut for adjusting the height of the cap B above the throat C of the chimney; and H, H, are three or more upright bars or standards, passing through the matrice holes in the cap B, upon which, by means of bolts or pins, it is supported. By these means the cap having become a fixture, in order to regulate the width of the opening or passage between it and the throat of the chimney, a rim or hoop I, I, is attached to the cap, which is made capable of adjustment in order to contract the passage to any desired dimensions. The lighter particles and the vapours which pass through this opening from the flues ascend into the upper part of the tower, which, as aforesaid, is high and capacious. An horizontal section of the tower is shewn at Fig. 3, cut through a little above the cap B, the top side of which is seen, and also the lodge floor G. The top of the tower is covered with a flat roof J, J, which assists in driving back any of the smoke and dence vapour which may have passed the cap, and also excludes the rain, hail, or snow from the tower and the chimney. Through this roof the shaft K of a vane passes and rests upon the cross beam F. A number of vent holes or openings L, L, L, are made through the walls of the tower at its upper part for the purpose of allowing the light vapours to escape from the inside; but to prevent stormy gusts of wind from driving back the vapour into the flue and obstructing the working of the furnaces, all the holes on the windward side of the tower are kept continually closed by a semicircular shutter M. This shutter is supported by arms attached to the shaft K, and is more perfectly seen in Fig. 4, the horizontal section of the tower, cut through at the vent holes near the top. At the top of the shaft K, on the outside of the tower, a vane N is attached, which, being acted upon by the wind, swings as the wind changes and turns the shaft round, carrying with it the semicircular shutter, by which it will be seen that from whatever point the wind blows, the vent holes on that side of the tower next to the wind are closed by the shutter, and the holes on the leeward side being unobstructed, the vapour from the smoke or steam, which is lighter than the common atmospheric air, will then escape, leaving the grosser and more pernicious particles deposited in the chimney below or upon the lodge floor, as above said. Besides preventing the nuisance occasioned by smelting or calcining furnaces of the old construction to the neighbourhood in which they may be erected, the heavy particles thus retained are extremely valuable; and hence, when the deposition has sufficiently accumulated, it is removed from the lodge floor and carried to the wasting furnace. This is done at a time when

the smelting furnaces are not at work, by a man entering at the door below and passing up the winding staircase shewn at *d* in the plan, Fig. 1, which conducts to the lodge floor above, when, by a shovel, the deposited matter is thrown down the well of the chimney and thence drawn off by barrows to be roasted and afterwards smelted. The flues of the furnaces must be supplied with dampers or shutters, as shewn at O, O, Fig 2, in order to cut off the communication with the chimney of any one of the furnaces which may not be at the time in use. By the employment this improved apparatus smelting and calcining furnaces are divested of their pernicious effects, and such works may in future be erected in any convenient situation, either near to dwelling-houses or by the sides of public roads, on the banks of navigable rivers or canals, and thus, in many cases, produces a very great economy in the expence of carriage. The saving effected by this apparatus in preserving a quantity of valuable matter which would otherwise, as heretofore, escape, to the injury of the neighbourhood, would of itself amount in one year, where four lead furnaces are employed, as described in the plan, to a sum equal to the entire cost of the improved apparatus, that is, of the upper part of the tower, with its roof, cap, vane, shutters, and appendages. Among other advantages, I propose that the tapping sides of my furnaces shall be opposite to each other, as shewn at *e*, *e*, and *e*, *e*, Fig. 1, so that, when required, the hot lead from both may be run into pigs or conveyed into one receiver, and from thence into a mould, so as to be formed into thick sheets ready for milling or rolling, by which a great saving of labour and expence will be effected, and the trouble and waste of remelting the lead avoided. I have, for the better understanding of my improvement, described many parts (as the furnaces) which are not new, but I wish it to be clearly understood that my Invention consists simply of the apparatus described as placed above the ordinary chimney of the smelting furnace, and the various parts of which are marked in the Drawing and referred to by capital letters, which apparatus I believe to be perfectly new as applied to that object, and therefore claim under my Patent the sole and exclusive right of employing the same.

In witness whereof, I, the said Joseph Wass (party hereto), have hereunto set my hand and seal, the Eighth day of October, in the year of our Lord One thousand eight hundred and twenty-two.

JOSEPH (L.S.) WASS.

A.D. 1822. June 15. № 4,682.
WASS' Specification.

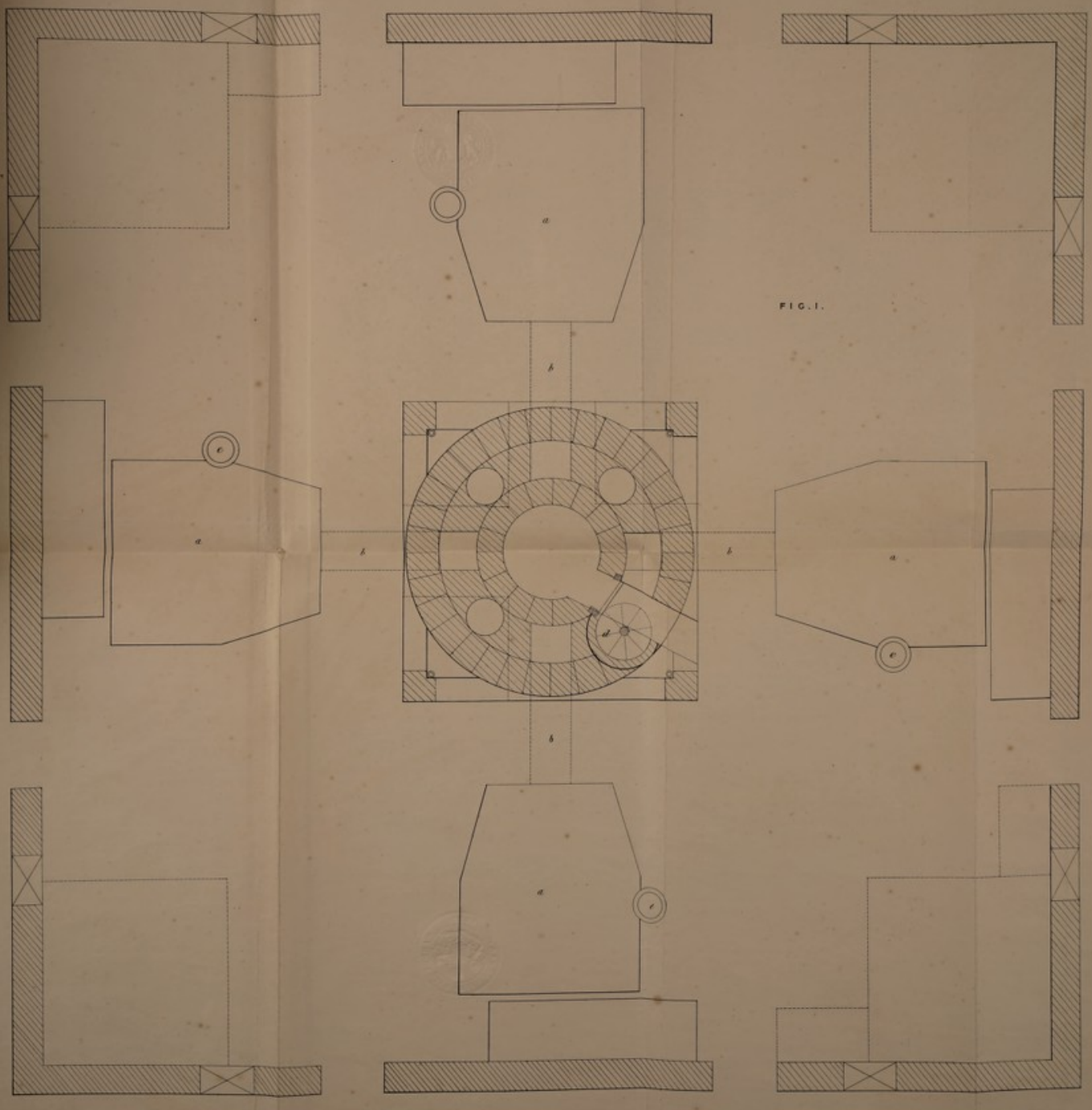
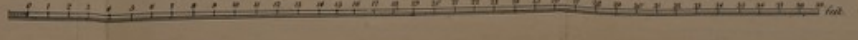


FIG. 1.



The enrolled drawing is colored.

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FIG. 4.

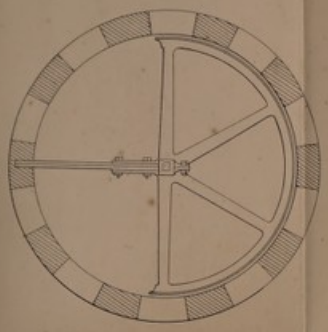

FIG. 3.

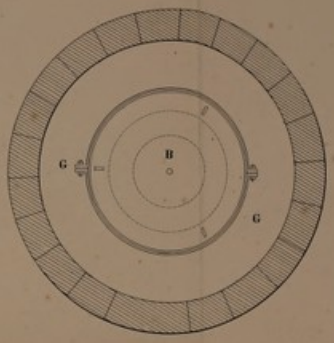

FIG. 2.

The enrolled drawing is colored.

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Printers to the QUEEN'S most Excellent Majesty. 1859.

AND BE IT REMEMBERED, that on the Eighth day of October, in the year of our Lord 1822, the aforesaid Joseph Wass came before our said Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form above written. And also the Specification aforesaid was stampt according to the tenor of the Statute made for that purpose.

STEPHEN.

Inrolled the Fourteenth day of October, in the year of our Lord One thousand eight hundred and twenty-two.

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1855.