

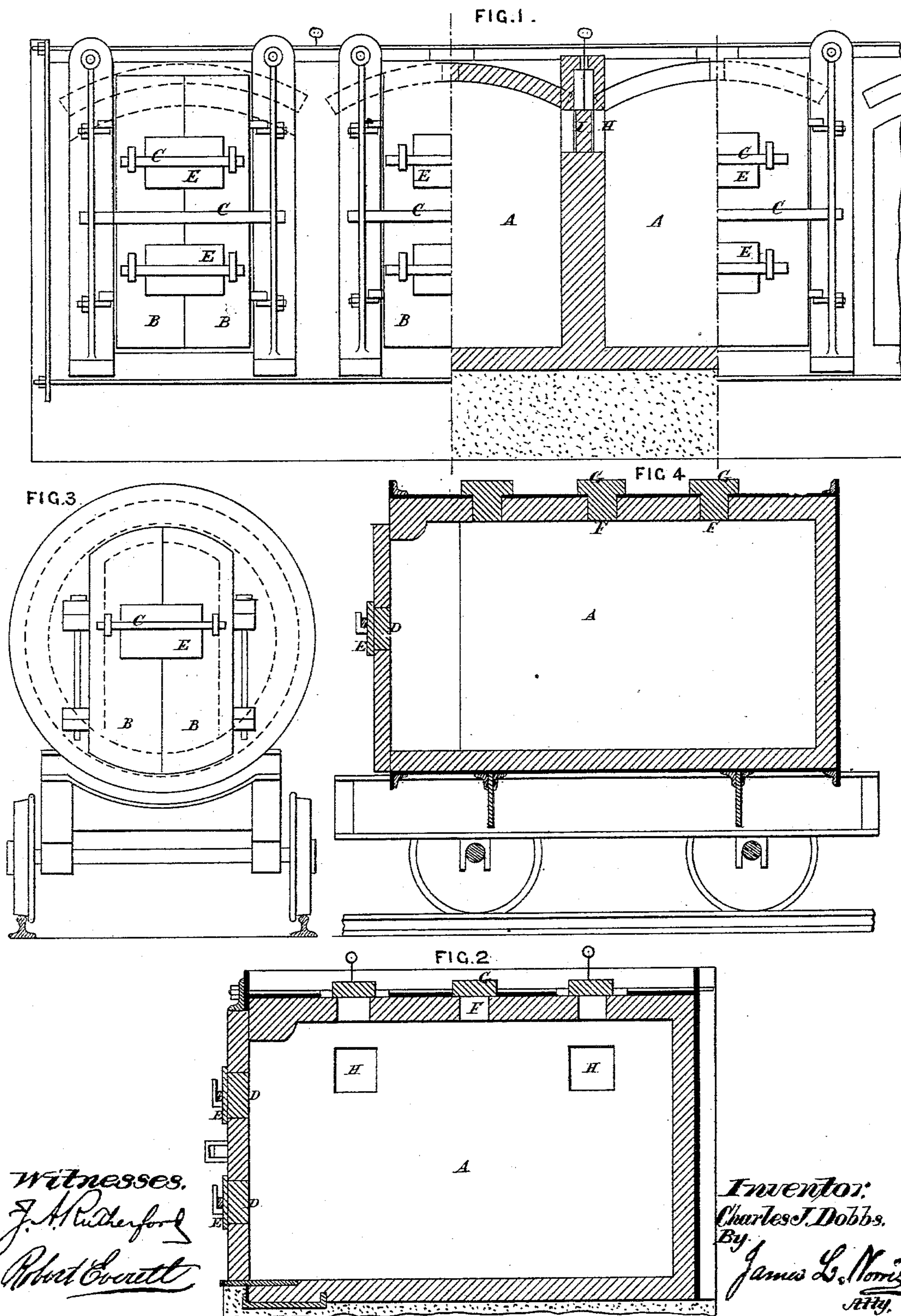
(No Model.)

C. J. DOBBS.

MANUFACTURE OF PAVING BLOCKS FROM FURNACE SLAG, &c.

No. 300,580.

Patented June 17, 1884.



UNITED STATES PATENT OFFICE.

CHARLES JAMES DOBBS, OF MIDDLESBROUGH, COUNTY OF YORK, ENGLAND.

MANUFACTURE OF PAVING-BLOCKS FROM FURNACE-SLAG, &c.

SPECIFICATION forming part of Letters Patent No. 300,580, dated June 17, 1884.

Application filed January 23, 1884. (No model.). Patented in England August 9, 1883, No. 3,870, and in Belgium January 3, 1884.

To all whom it may concern:

Be it known that I, CHARLES JAMES DOBBS, a citizen of England, residing at Middlesbrough, in the county of York, England, have
5 invented a new and useful Improved Manufacture of Paving-Blocks from Furnace-Slag and an Apparatus for that purpose, (for which I have obtained a patent in Great Britain, No. 3,870, of 1883,) of which the following is a
10 specification.

In the manufacture of paving-blocks from slag as at present carried out the slag is run directly from the blast-furnace into iron molds arranged round a turn-table, and when the
15 mass is just set the blocks are allowed to fall out of the molds and are put into a kiln of large dimensions previously heated by fire, where they are allowed to remain about fifteen or twenty hours, so as to become thoroughly
20 annealed, whereupon the kiln is opened and the bricks are allowed to cool gradually.

Now, my present invention has for its object to obviate the expense consequent upon having to heat the large kilns in the first instance; and it consists in effecting the perfect annealing of the blocks solely by their own initial heat—that is to say, without any preliminary firing of the kiln—this being rendered possible by constructing the kilns in a different
30 manner to that heretofore employed—namely, instead of constructing them of one large chamber requiring a large number of blocks to fill it, I construct them with a series of separate chambers of smaller size, each of which is
35 charged separately with a moderate number of blocks, and which are, by preference, made to communicate with each other by means of flues provided with regulating-slides, so that the surplus heat given off from the blocks in the
40 one chamber may be led off to another chamber, in order to heat it to a certain extent before receiving its charge of blocks. By employing this arrangement I have found from experiment that the heat retained by the central portion of the blocks, which is still in a
45 more or less liquid state when they are introduced into the kiln, is sufficient to effect the perfect annealing of the blocks without the use of additional firing, as such central heat is
50 gradually conveyed by conduction to the more or less cooled outer portion of the block, thus

rendering the temperature of the block uniform throughout, in which condition it is allowed to cool down gradually.

Although I prefer to construct the kiln with
55 groups of small chambers, as described, yet in cases where only a limited ground-space is available near the blast-furnace, I construct the said small annealing chambers or kilns separately, and in some cases I mount them
60 upon carriages, so that each chamber may be run near to the blast-furnace to receive its charge, and be then removed to a locality where sufficient ground-space is available. By the use of such small-sized kilns or anneal-
65 ing-chambers, whether fixed or movable, I am also enabled to utilize the slag from smaller furnaces than those to which the process has hitherto alone been applied with advantage. The said movable kilns or annealing-chambers
70 may also be used with advantage to supplement the fixed kilns at blast-furnaces that are of such large dimensions that the whole of the available slag-supply cannot be utilized by fixed kilns on account of the limited space
75 near to the blast-furnace.

The accompanying drawings show, by way of example, two constructions of annealing kilns or chambers for carrying out my said
80 invention.

Figure 1 shows a part front elevation and part section of a series of annealing-chambers, A A, arranged side by side; and Fig. 2 shows a longitudinal section of one of the chambers.

The chambers A are formed of brick-work
85 with an iron casing, and they are closed in front by two folding doors, B B, lined with fire-brick, secured by a bar, C, and having formed in them two openings, D D, closed by slabs E E. The chambers are also provided
90 with openings F at top, closed by slabs G, and in the partition-walls are formed other openings, H, provided with a slide, I, on raising which the one chamber can be made to communicate with the contiguous one.
95

The slag having been run into the iron molds in the ordinary manner, and the blocks having become set in the molds, the latter are at once charged into the chambers, first through the lower opening, D, and afterward through the
100 upper one. The chamber having been filled, the openings D are closed, whereupon the

greater heat contained in the central portion of the blocks will be gradually conveyed by conduction to the outer surfaces, thereby rendering the block of a perfectly uniform temperature throughout. In this condition the blocks are allowed to remain about twelve hours and then to cool down gradually, whereby they become perfectly annealed without any additional heating of the chambers being required beyond that which is obtained by radiation from the blocks themselves. During the cooling the slide I may be opened, so as to allow a portion of the heat given off to pass by radiation into the next chamber, so as to heat this to a certain extent before receiving its charge of blocks, and the openings F and doors E may also be opened more or less, if found necessary to accelerate the passage of heat. The blocks having cooled down to a sufficient extent, the doors B B are opened for the removal thereof, after which the chamber can be at once charged with fresh blocks.

Fig. 3 shows an end elevation, and Fig. 4 a longitudinal section, of an annealing kiln or chamber mounted on wheels, so as to be capable of being brought near the blast-furnace to receive its charge of blocks, and then removed to a convenient place, as above described. The chamber A is here shown of cylindrical shape for obtaining the requisite strength without staying. It may, however, be made of a rectangular or other convenient shape. The construction of the chamber is otherwise the same as at Figs. 1 and 2, the parts being designated by the same letters of reference, and therefore requiring no further description.

Having thus described the nature of my in-

vention and the best means I know of carrying it out in practice, I claim—

1. The within-described method of manufacturing paving-blocks from furnace-slag, the same consisting in running the slag into metallic molds and letting it "set" therein, then, and while the slag blocks still retain their initial heat, transferring them into a kiln or chamber of proper dimensions and inclosing them therein, whereby the initial heat contained within the slag blocks without the aid of extraneously-applied heat will anneal the blocks, substantially as set forth.

2. In an annealing-kiln, the combination of a series of chambers located side by side and communicating with each other through suitable passages, whereby the heat evolved from the slag blocks in one chamber will pass into the communicating-chamber to heat the same, substantially as set forth.

3. A kiln for annealing slag blocks, composed of a series of chambers located side by side and communicating with each other through suitable passages and mounted upon wheels, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses this 7th day of January, A. D. 1884.

CHARLES JAMES DOBBS.

Witnesses:

THOMAS R. DENT,
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Clerk, 25 Pierson St., North Ormesby.