

(No Model.)

W. & J. OAKES.
KILN.

No. 511,026.

Patented Dec. 19, 1893.

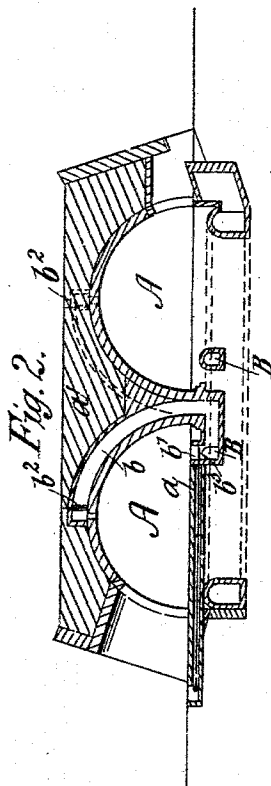
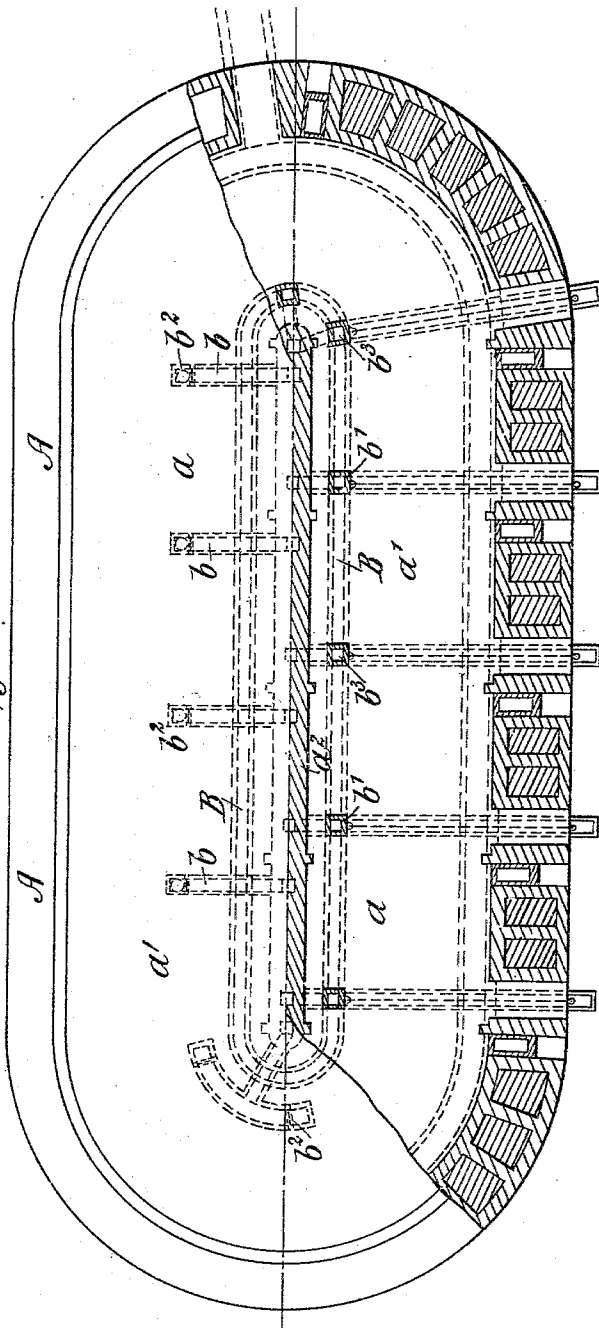


Fig. 1.



Witnesses
Frank William Pattison
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William Oakes & James Oakes
by their Attorney
George Henry Rayner

UNITED STATES PATENT OFFICE.

WILLIAM OAKES AND JAMES OAKES, OF LEEDS, ENGLAND.

KILN.

SPECIFICATION forming part of Letters Patent No. 511,026, dated December 19, 1893.

Application filed September 5, 1893. Serial No. 484,874. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM OAKES, builder, and JAMES OAKES, engineer, subjects of the Queen of Great Britain and Ireland, both of Anchor Street, Hunslet, Leeds, in the county of York, England, have invented Improvements in Kilns for Brick, Lime, and the Like, of which the following is a specification.

This invention relates to improvements in the construction of kilns for brick, lime and the like, and has for its object to provide an improved means whereby the heat commonly wasted in letting the fully burned material cool will be utilized for heating the raw material.

Under the floor of the kiln around the central dividing wall a continuous flue is provided, having branches leading into the chamber, two into each division. One of these leads into the division through the roof and the other through the floor of the chamber, each being furnished with a damper to regulate the aperture or close the flue. The heat from the burning material will pass through the upper flue when opened, thence downward into the main flue and into the division containing the raw material when the damper governing that part is opened, thus transferring the heat otherwise wasted to the cooler parts.

In order that the invention may be more clearly understood, reference is had to the accompanying drawings, in which—

Figure 1 is a plan partly in section and Fig. 2 is a cross section of a kiln constructed according to our invention.

A is the kiln with floor a and roof a' constructed in any ordinary manner and furnished with the usual flues and openings for charging and emptying. Under the floor and around the central division a^2 is placed the continuous flue B, from which at the required intervals the branch flues b pass through the partition a^2 and the roof a' to

the top of the kiln opening into the latter at about the center as shown. At corresponding intervals the branches b' are provided opening from the flue B into the lower part of the kiln. The branch flues b and b' are all furnished with dampers b^2 and b^3 , having the necessary rods and handles so that any flue can be opened or closed irrespective of the rest. The end flues b are preferably connected together and have only one branch passing to the main flue B, so that less space will be occupied in the division a^2 . It will be seen that with this arrangement on opening any top flue of a division containing burned or burning material, and a bottom flue b' at any other part generally at the other side or end, the hot air will pass through the flues b to the central flue B and thence to the cool division through the open flue b' . Owing to the heated air coming into the cool part through the floor it will be caused to pass through the material much more thoroughly than by introducing it from the top, drawing the heat freely from the top of the heated material.

What we claim as our invention, and desire to secure by Letters Patent, is—

An improved means for utilizing waste heat in brick and like kilns, consisting of a continuous flue around the middle division of the kiln and under the floor, having two sets of branch flues, each flue furnished with a damper passing respectively through the roof and floor of the kiln, and opening into the latter at top and bottom arranged substantially as and for the purposes specified.

In witness whereof we have hereunto set our hands this 10th day of August, 1893.

WILLIAM OAKES.
JAMES OAKES.

In presence of—

EDWD. WHITELEY,
JOSH. HY. WHITAKER,
Solicitor's Clerks, Leeds.