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(71) Applicant: **Forgestal, S.L.**
08292 Esparraguera (ES)

(72) Inventor: **Planas Vives, Bernat**
08700 Igualada (ES)

(74) Representative:
SUGRANES - VERDONCES - FERREGÜELA
Calle Provenza, 304
08008 Barcelona (ES)

(54) Fixation device for refractory supporting blocks for tunnel kiln cars

(57) Fixation device (1) for ceramic refractory supporting blocks (2), for tunnel kiln cars, characterized by comprising several fixation parts (3) adapted to fit into complementary holes or notches (4), made in corresponding contiguous blocks. The assembled contiguous blocks are prevented from doing movement and/or turn relatively big allowing the differential thermal expansions of the assembled material.

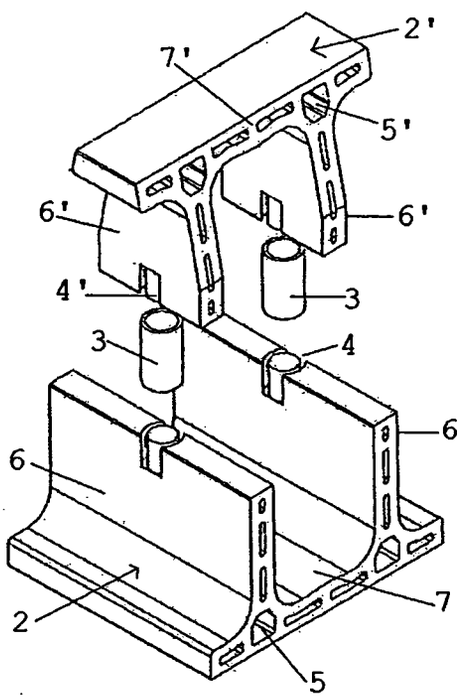

FIG. 4

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Description

Technical sector of the invention.-

[0001] The present invention refers to a fixation device for refractory supporting blocks for tunnel kiln cars, of the type which are assembled together forming the upper part of the kiln cars. Specifically, the device of the invention is used with advantage to fix together the supporting blocks with a "bridge" or " PI letter" shape.

Background of the invention.-

[0002] Usually, in the ceramic industry, the parts being produced are supported and transported on kiln cars that move along the production plant, and on those cars they accede and are submitted to the several process operations. Usually, an assembly of supporting blocks, made of refractory blocks, is placed in the upper part of the kiln car, this assembly of supporting blocks supporting the pieces to be produced, set in one or more layers.

[0003] Supporting blocks in a prismatic shape, with a "PI letter" shaped section shape formed by 2 side piers and a bridge part joining them, are well known. Those blocks are usually solid or containing holes for an easier air circulation and, therefore, producing a better heat transmission from the ceramic pieces in contact with the refractory supporting blocks assembly.

[0004] It is also well known the use of flat smooth refractory slabs, supported by piers. This kind of assembly is not very stable, because the component parts are only supported on each other, but never fixed together so that they could work as a complete block. As a consequence, it is quite usual that this kind of structure gets disassembled, at least partially, as a consequence of the loading and unloading of the ceramic pieces, or of the thermal expansion and shrinkage of the refractory supporting blocks.

[0005] Fixation devices based on adhesives is not a good solution for refractory blocks, because such adhesives do not allow for the differential expansion of the two materials to be fixed.

[0006] This problem is solved by the object of the present invention.

Explanation of the invention.-

[0007] The refractory supporting blocks fixation device of the present invention is essentially characterized by the fact of being composed of several fixation parts, adapted to fit into corresponding complementary holes or notches made in corresponding contiguous blocks, in such a way that the assembled contiguous blocks are prevented from doing movement and/or turn relatively big yet allowing the differential thermal expansions of the assembled material.

[0008] According to another characteristic of the invention, the above mentioned fixation parts are made of hollow tubes, or of bars or pegs, preferably with a cross section similar to the section of the holes or notches made in the fixed refractory blocks, so that the fixation parts, when introduced in the holes or notches, fit with a small gap in between.

Brief description of the drawings.-

[0009] The attached drawings illustrate, for a better understanding and as an example, a non-restrictive particular example of one of the possible execution shapes of the fixation device of the present invention:

Fig. 1 is an isometric view of a refractory supporting block, where a hole has been made.

Fig. 2 shows an example of a fixation part, in a big scale isometric view.

Fig. 3 shows an isometric view of a refractory supporting block, where a hole has been made in one of its faces, containing a fixing part, partially introduced in the hole.

Fig 4 shows an isometric view of two refractory supporting blocks, with more than one hole made per block, in order to make them able to receive more than one fixation parts per pair of blocks; and

Fig. 5 is an isometric view of an assembly of two refractory supporting blocks, fixed together according to the object of the present invention, showing the blocks superimposed on their piers, on which one or more holes have been made, and being fixed together by at least one fixing part.

Detailed description of the drawings.-

[0010] In these drawings, it is possible to see that, according to the object of the present invention, the fixation device for contiguous refractory supporting blocks 2, 2' consists of several fixation parts 3, adapted to fit into corresponding holes or notches 4. In the execution shape represented in the drawings, the fixation parts 3 are cylindrical tubular and they fit into circumferential holes 4, but they could also fit into hollow cylindrical holes. The fixation parts 3 could also be bars or pegs, in this case necessarily fitting into corresponding hollow cylindrical holes. The refractory supporting blocks 2, 2', in the represented case, are of the kind of blocks made of a prismatic shaped refractory piece, with a "PI letter" like section shape formed by 2 side piers 6 and a bridge part 7 joining them, with several holes 5 parallel to its generating direction. The fixation part 3 fits into the holes 4 made in the piers 6 of the refractory supporting blocks 2, 2'.

[0011] This technical solution for the fixation of refractory supporting blocks 2, 2' can, of course, be used for the fixation of blocks and pieces of different sizes and shapes, as blocks and fixation parts of quadrangular or polygonal transverse section shape, and still being included within object of the present invention.

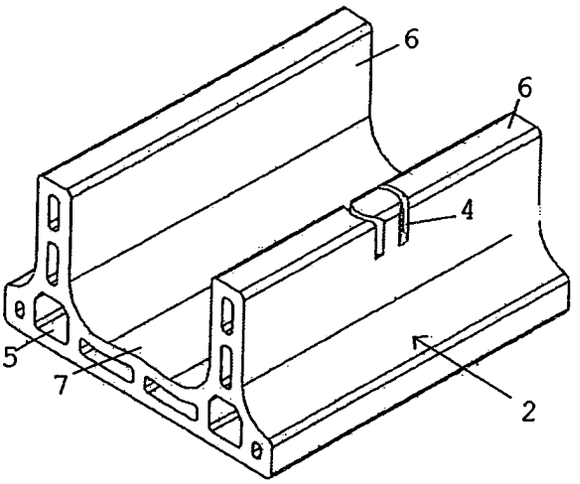
Claims

1. Fixation device (1) for ceramic refractory supporting blocks (2), for tunnel kiln cars, of the type of the ones that are assembled together forming the upper part of the kiln car, **characterized by** comprising several fixation parts (3) adapted to fit into complementary holes or notches (4), made in corresponding contiguous blocks, in such a way that the assembled contiguous blocks are prevented from doing movement and/or turn relatively big yet allowing the differential thermal expansions of the assembled material.

2. Fixation device (1) for ceramic refractory supporting blocks (2), according to claim 1, **characterized by** the fact that said fixation parts (3) are made of hollow tubes, with such a cross section that they can be introduced in the corresponding holes or notches (4) without any gap or with a small gap.

3. Fixation device (1) for ceramic refractory supporting blocks (2), according to claim 1, **characterized by** the fact that said fixation parts (3) are made of bars or of pegs, with such a cross section that they can be introduced in the corresponding holes or notches (4) without any gap or with a small gap.

FIG.1



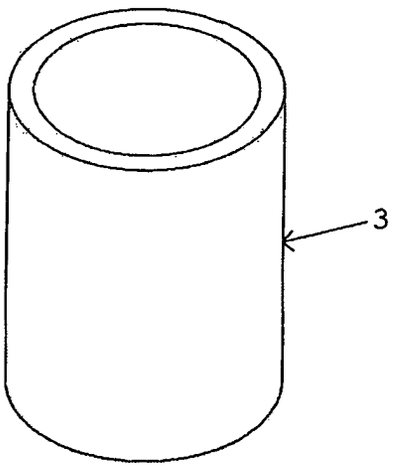
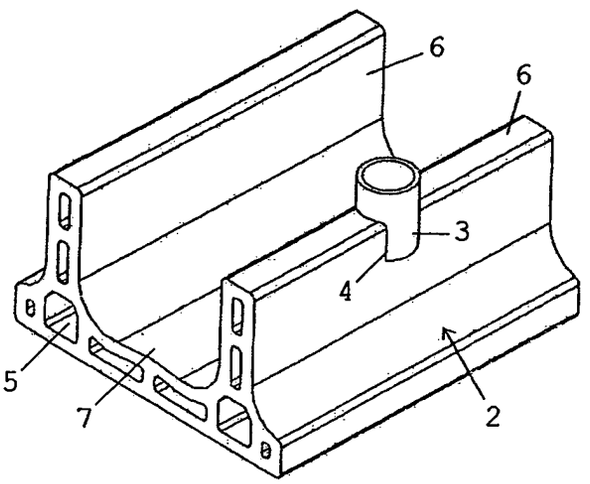


FIG.2

FIG.3



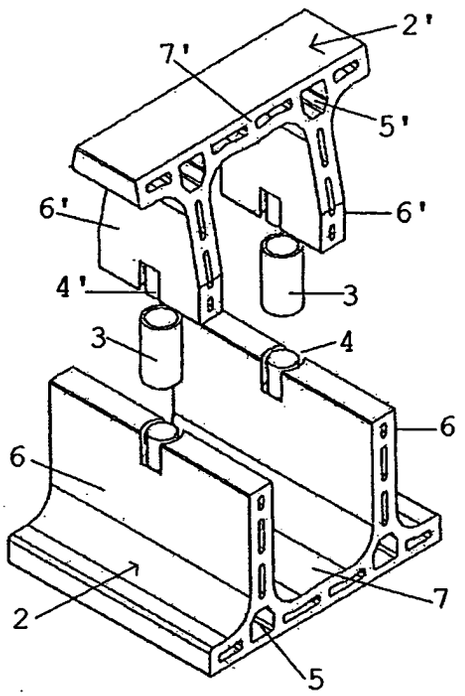


FIG.4

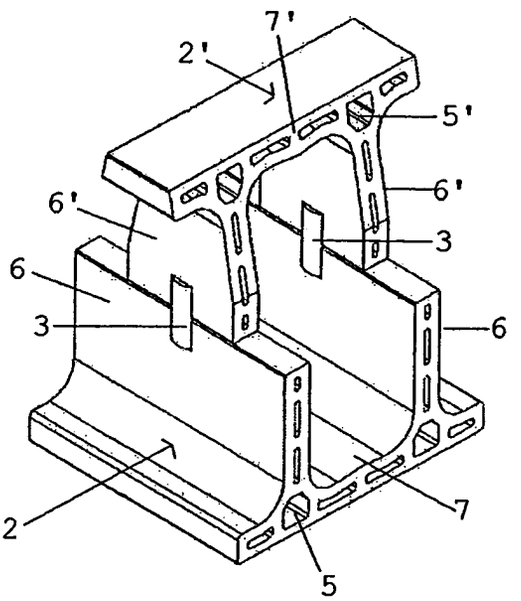


FIG.5

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EUROPEAN SEARCH REPORT

Application Number
EP 03 38 0164

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	FR 952 662 A (ETABLISSEMENTS RENE AMAND & CI) 22 November 1949 (1949-11-22) * the whole document * ---	1,3	F27D3/12 F27D5/00 F27D1/14
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

F27D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	24 September 2003	Peis, S

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 03 38 0164

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24-09-2003

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