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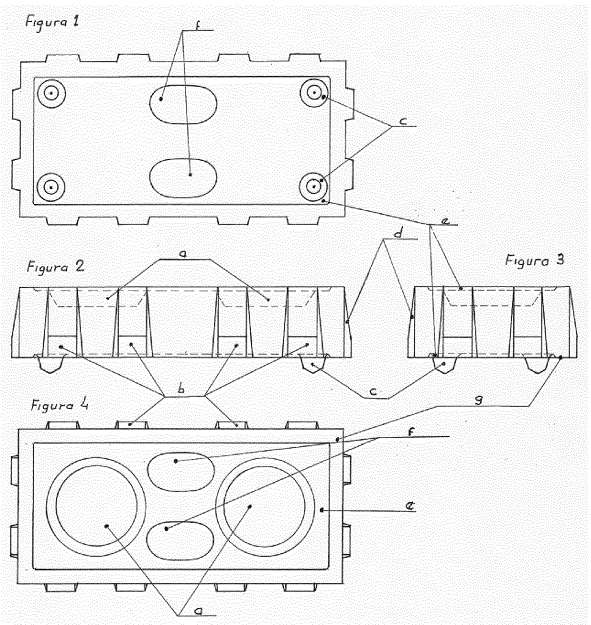
(54) **BASE BRICK FOR LAYING FOUNDATIONS AND POSITIONING BRICKS WITH SYSTEMS FOR FITTING BRICKS TOGETHER**

(57) The invention relates to a base brick having its own technical characteristics on the upper face thereof (two cavities, an indentation, and two channels), on the lower face thereof (four feet, an indentation and two channels), and on the four side faces thereof (twelve separating pegs with twelve guiding wedges). The twelve separating pegs are used to obtain a precise gap in the four directions which allows equal distance between the cavities of the system for fitting the bricks together and the guiding wedges facilitate the rapid positioning of the base bricks. Said technical characteristics allow the base brick to provide perfect laying of foundations and positioning of the self-centring bricks and other bricks comprising systems for fitting the bricks together.



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Description

FIELD OF THE ART

[0001] The invention of the base brick falls within the technique or method of construction intended to improve the foundations and laying of bricks that have a system for fitting bricks together.

INDICATION OF THE STATE OF THE PRIOR ART

[0002] We depart from the knowledge of the system for fitting the bricks together that has the self-centring brick, of own patent no. 200701565, publication no. ES 2336398, titled "Self-centring solid or exposed brick", which has as technical characteristics in the upper face (two tapered cavities, two through channels and an indentation to contain mortar) and in the lower face (two groups of three steely rods, four feet to achieve the level and leave a gap to the mortar, two through channels and an indentation to contain mortar). The system for fitting bricks together of the self-centring brick is achieved because the virtual diameter described by the two groups of three rods of each brick is fitted perfectly when matching with the distance and the lesser diameter of the two tapered cavities of the opposite brick, due to its self-centring characteristics, the alignment, height and level between rows of bricks are guaranteed and because it is a system for fitting bricks together, the earthquake resistance of the wall formed increases.

[0003] But there is a problem when trying to get that the fitting elements to match between the self-centring bricks when they are placed in a staggered way, since it must be taken into account from the first row with a certain gap distance between the bricks, so it is necessary that the first row is composed of bricks that originate the exact separations.

[0004] Also, experience has shown that it is possible to improve the earthquake resistance of a wall built with bricks embedded from the foundation. To achieve this improvement it is necessary an efficient method for the settlement of the bricks in the foundation and a tenacious method of positioning thereof to achieve a greater strength on the base, and by extension, on the wall and the building.

EXPLANATION OF THE INVENTION

[0005] The present invention illustrates a construction method with bricks, with systems for fitting bricks together comprising the use of a construction unit called base brick, modes of settlement of base bricks on the foundations and a method of effective placement of base bricks to achieve a greater earthquake resistance. In relation to the State of the prior art, this invention solves several problems by incorporating the following advantages:

- It allows obtaining the appropriate height, alignment and level among bricks from the beginning of the wall. Given that it is fitted bricks, this advantage benefits the speed and easily in the rising of the full wall.

- It allows reaching the proper separation distance between the base bricks in the first row and in the successive rows, by matching exactly all fitting elements of the bricks and leaving between them a precise space or gap.

- It achieves strengthening adherence of the walls on foundation since base bricks settles in the building foundations in a fitted or overhung manner and they are compacted with the mortar, making the construction to improve their earthquake-resistant and high-security features.

- It provides an effective placement process by cutting lines or gaps by putting a brick transversally on the previous one, with the intention of increasing earthquake resistant features of the base of the building. This advantage is only persistent in bricks that have a system for fitting bricks together.

DESCRIPTION OF THE DRAWINGS

[0006] For a better understanding of the invention, a set of drawings accompany to the specification wherein the characteristics of the base brick as a construction unit, the modes of settlement of base bricks on the foundations, and the method of effective positioning of base bricks to achieve a greater earthquake resistance, are described.

Figure 1. Plan drawing of the lower face of base brick showing an indentation leaving a perimetrical frame, four settlement feet, two mass-through channels and twelve separating pegs.

Figure 2. Elevation drawing of base brick in long side view, showing the surface with four separating pegs, the tapered surface of four guiding wedges associated with said pegs and the settlement feet.

Figure 3. Elevation drawing of base brick in short side view, showing the surface with two separating pegs, the tapered surface of two guiding wedges associated with said pegs and settlement feet.

Figure 4. Plan drawing of upper face of base brick showing an indentation leaving a perimetrical frame, two tapered cavities, two mass-through channels and twelve separating pegs.

Figure 5. Elevation drawing of fitted settlement mode in foundations, showing the box formed in the foundation, the support of feet of the base brick in the bottom of the box, the fitting of rods of a self-centring

brick into the cavities of two base bricks and the spaces of mortar which, when solidified, forms a body.

Figure 6. Elevation drawing of overhung settlement mode in foundations, showing the support of feet of the base brick in foundation, the fitting of the rods of two self-centring bricks into the cavities of a base brick, and the spaces of mortar which, when solidified, forms a body.

Figure 7. Plan drawing of placement of a foot of base bricks in the fitted settlement mode, showing as an example the construction of a corner in the effective positioning process of cutting the gaps to obtain a greater earthquake resistance.

DETAILED EXPLANATION OF AN EMBODIMENT OF THE INVENTION

[0007] Below the base brick is detailed as a construction unit with technical characteristics designed for the self-centring brick, modes of settlement in the foundation and a method of effective placement.

A) Technical characteristics of base brick as a construction unit.

1 - On its upper face has (Figure 4).

- Two tapered cavities (a) with diameters, depth and distance between cavities coincident with the self-centring brick. Other systems for fitting bricks together, sizes or shapes can be designed in such face if this is the case of other bricks.

- An indentation (e) with a given depth, leaving a perimetrical frame (g) to accommodated the mortar. This feature does not prevent from making another system for fitting bricks together for other bricks.

- Two mortar-through channels (f), to facilitate the cross cutting in the centre in case of a half of brick is necessary. This feature does not prevent from making another system for fitting bricks together for other bricks.

2 - On its lower face has (Figure 1):

- Four feet (c) to reach the appropriate height, alignment and level, leave space for the mortar and achieve the perfect settlement on the foundation. These four feet (c) are essential features for the base brick.

- An indentation (e) with a given depth leaving a perimetrical frame (g) to contain the mortar and serve as a brake for a possible horizontal displacement of the brick once the mortar is solidified. Always with the idea of improving earthquake resistant properties of the construction.

- Two mass-through channels (f), to facilitate the cross cutting in the centre in case of a half of brick is necessary.

3 - On its side faces has (Figures 2 and 3):

- Twelve separating pegs (b), being four pegs in each of the two long sides and two pegs in each of the short sides. These twelve separating pegs (b) are intended to give the perfect separation between the base bricks to achieve equal distance between the cavities of the fitting of staggered bricks in the upper row.

- Twelve guiding wedges (d) associated with the separating pegs, facilitating placement on vertical of the base brick both for manual and automated positioning, with the aim of perfecting the robotic automation in large buildings.

B) Modes of settlement of base brick in the foundation (once the layout is decided):

- Fitting (Figure 5). To achieve this mode of settlement, it is necessary to construct in the foundations (k) a hole (1) having a perfect level in its bottom and higher dimensions according to the form of placement of the brick base, either for a wall of half a foot, a foot, foot and half, two feet, etc. Once base bricks (i) are placed, the hole (1) is filled with mortar (j) up to the half of the brick. Once the mortar (j) is solidified around the base brick (i), the self-centring bricks of the first row (h) can be placed above, perfectly fitted. This system will be much stronger for the construction of buildings with earthquake-resistant and high-security features.

- Overhang (Figure 6). To achieve this mode of settlement is enough with to settle the base brick (i) on the foundation itself (k) and add the mortar (j) enough to cover all the side of the base brick (i). Once the mortar (j) is solidifies around the base brick (i) the self-centring bricks of the first row (h), can be placed above, perfectly fitted.

C) Process of effective placement of the base brick in the fitted settlement mode to form a structural element (Figure 7), as an example a corner.

- A determined hole (1) is carried out in the foundations (k) which must have the proportions of the layout of the wall that is to be performed, for the subsequent placement of base bricks (i) and pouring of a seat of mortar (j).

- Base bricks (i) are adjusted through their separating pegs (b), which provide the same space or gap between bricks and allow achieving total equal distance between all the cavities due to the perfect separation achieved.

- The mortar (j) is poured up to the half of the base brick (i) and compaction succeeds in increasing the resistance to horizontal forces caused by a possible earthquake.

[0008] In the process of linear placement of the base bricks, for a greater efficiency, the gaps are cut putting in a cross-cutting manner a brick to the former, with the intention of increasing the earthquake resistant features of the wall from the base. This advantage is only efficient in bricks with systems for fitting bricks together.

[0009] In addition, if, in the process of placement of upper rows of bricks, the gaps are cut crossing in an alternating manner the fitting elements, the wall will multiply its resistance to any force external even more, both horizontal and vertical. This advantage would be applied to construct earthquake-resistant and high-security buildings.

INDICATION OF THE INDUSTRIAL APPLICABILITY

[0010] The industrial applicability of the base brick base is obviously derived from the nature of the invention and the explanation thereof.

Claims

1. Base brick for laying foundations, **characterized by** having:

   - On the upper face thereof two tapered cavities (a), an indentation (e), a perimetrical frame (g) and two channels (f).
   - On the lower face thereof four feet (c), an indentation (e), a perimetrical frame (g) and two channels (f).
   - On the side faces thereof twelve separating pegs (b), being four pegs on each of the two long sides and two pegs on each of the short sides and twelve guiding wedges (d) associated with the separating pegs.

2. Method for positioning base bricks according to claim 1, **characterized in that** it comprises the following stages:

   a) Laying bricks on foundations.
   b) Union between the bricks, adjusting them by the separating pegs (b) in order to achieve the same space or gap between bricks (i) and the equal distance between the cavities.
   c) Adhesion of bricks with mortar.

3. Method for positioning according claim 2, **characterized in that** the placement of the bricks on the foundation is carried out using fitting, supporting the feet (c) of base brick (i) at the bottom of a box or hole (1) made, for this purpose, in the foundation (k); the box or hole (1) must have the proportions of the reconsideration of the wall that is to be made; once the bricks (i) are placed into the hole (1), it is filled with mortar (j) until the middle of the bricks.

4. Method for positioning according claim 2, **characterized in that** the placement of the bricks on the foundation is carried out by overhanging, supporting the four feet (c) of the base brick (i) on the foundation itself (k); once the bricks (i) are placed, it is added mortar (j) sufficient to cover all of the sides of the base brick (i).

5. Method for positioning according claim 2, **characterized in that** the placement of the bricks is performed putting transversally a brick on the previous one, cutting the gaps, in order to achieve a greater strength from the base.

Figura 1

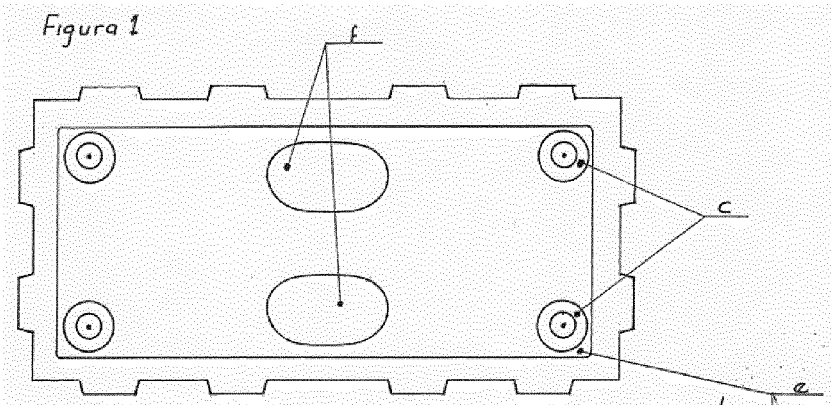


Figura 2

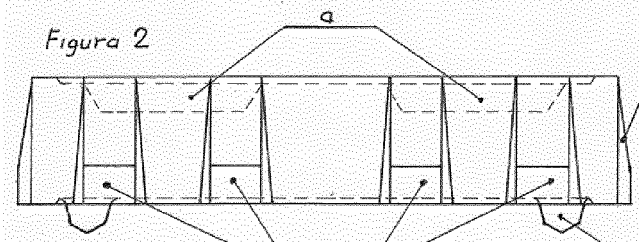


Figura 3

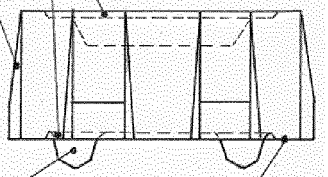


Figura 4

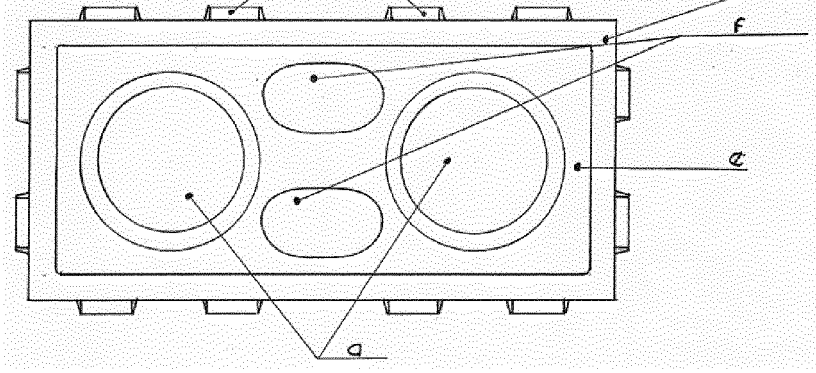


Figura 5

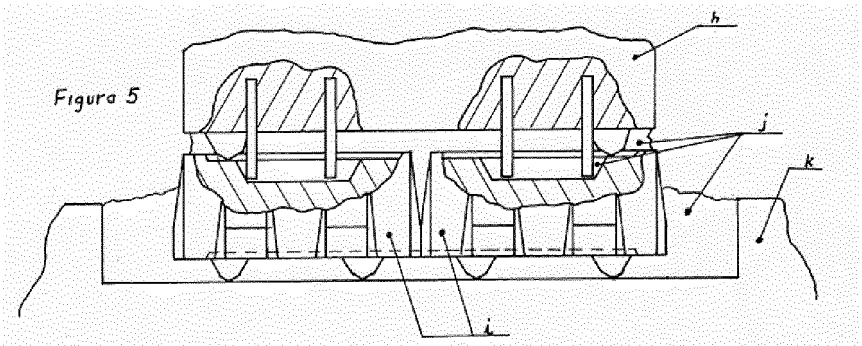
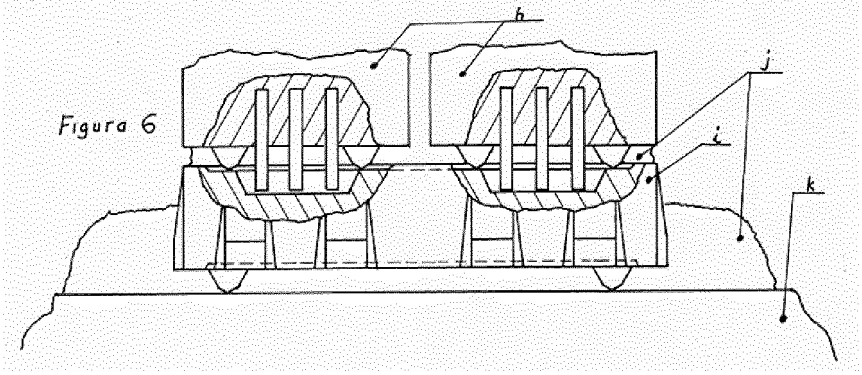


Figura 6



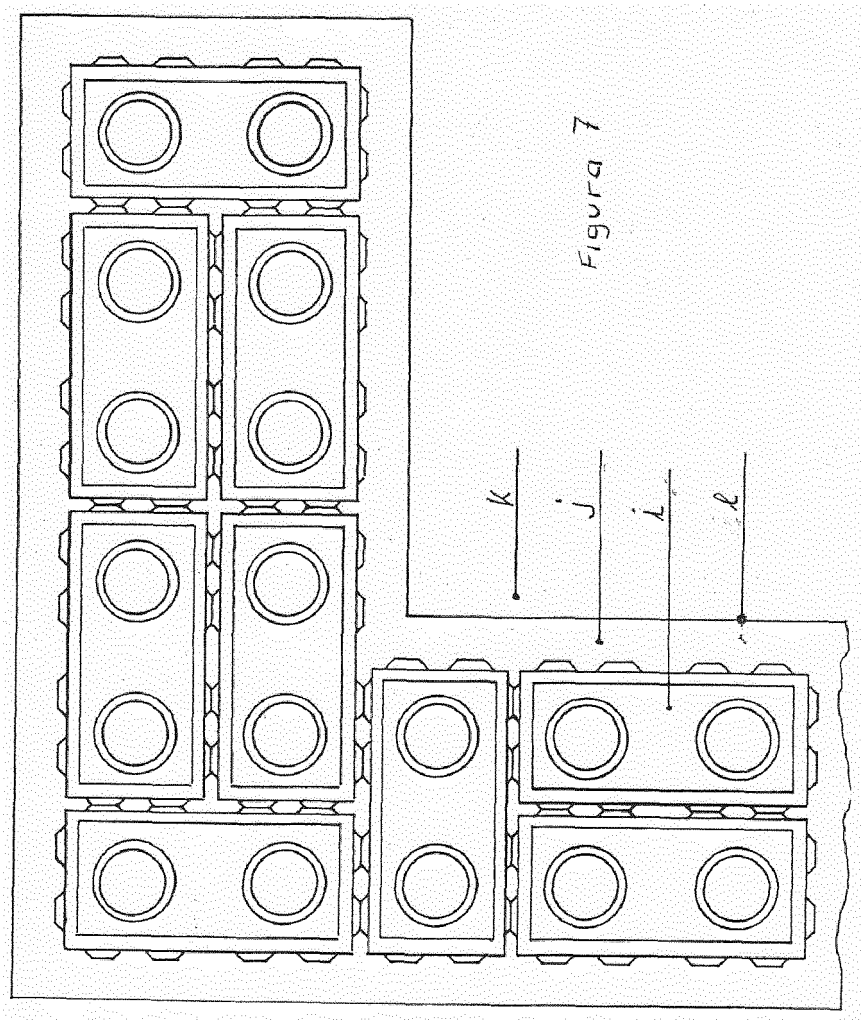


Figura 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2014/000214

A. CLASSIFICATION OF SUBJECT MATTER

E04B2/18 (2006.01)
E04C1/39 (2006.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E04B, E04C, E01C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ES 2336398 A1 (VILLAMARIN MORA ANDRES VILLAMARIN MORA ANDRES ET AL.) 12/04/2010, page 3, lines 19 - 36; figures 1 - 3.	1
A	US 2688245 A (VESPER GEORGE A) 07/09/1954, column 2, line 22 - column 4, line 42; figures 1 - 4.	1
A	US 429061 A (REYNHOLD C.) 27/05/1890, the whole the document.	1
A	US 1058674 A (KERTES JOHN) 08/04/1913, page 1, line 71 - page 2, line 16; figures 1, 2.	1-4
A	GB 2355027 A (LAUBSCHER ALAN TREVOR) 11/04/2001, page 2, paragraph 5; figures 1, 6.	1, 2

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
05/03/2015	**(06/03/2015)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer S. Fernández de Miguel Telephone No. 91 3495437

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2014/000214

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 763945 A (WHITMORE WILLARD) 28/06/1904, the whole document.	1, 2
A	DE 3331137 A1 (SCHULER WERTBETON GMBH) 28/03/1985, & Abstract from DataBase WPI. Retrieved of EPOQUE; AN 1985-081670; figures.	1, 2
A	US 2192366 A (POROMA JOHN A) 05/03/1940, page 1, lines 18 - 53; column 2, lines 18 - 53; figure 1.	2, 5

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/ES2014/000214

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
ES2336398 A1	12.04.2010	NONE	
US2688245 A	07.09.1954	NONE	
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DE3331137 A1	28.03.1985	NONE	
US2192366 A	05.03.1940	NONE	

Form PCT/ISA/210 (patent family annex) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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- ES 200701565 **[0002]**
- ES 2336398 **[0002]**