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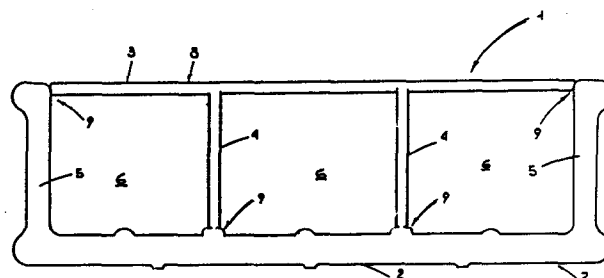
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⑤④ **Multiple use building trade block and building structure utilizing the said block.**

⑤⑦ The invention belongs to the technical field of components for buildings and, in particular, relates to a multiple use building trade block and to the building structure utilizing the said block.

The block 1 according to the invention comprises a resistant part 7 defined by a first main surface 2 and by the longitudinal sides 5 of the said block, and an auxiliary part 8 defined by a second main surface 3 and by the internal ribs 4, the cross-sections of the said resistant part 7 being greater than those of the said auxiliary part 8.

Furthermore, it is envisaged that in the areas of connection between the said resistant part 7 and the said auxiliary part 8 be fashioned concavities 9 for encouraging the separation, one from the other, of the said parts.



## 2.

building structures create considerable practical problems both from a formation viewpoint and as regards the connection thereof to parts that are not made of concrete. Such practical problems could be solved by placing suitably sized burnt clay elements around the concrete. This being the situation, the technical task forming the basis of the invention is to devise a block which, apart from specific uses of a conventional type, can also be utilized in various ways in a building structure, so as to overcome the above mentioned shortcomings.

One important object within the framework of the said technical task is to devise a block able, at the choice of the user, to adopt a variety of structural configurations without any need for adaptation operations that are complex or call for the use of special equipment.

Another, though not final, object of the invention is to devise a block that is simple and can easily be produced by industries in the field concerned.

These objects and others too that will become more apparent below are achieved with the multiple use building trade block according to the invention, of the type defined by a flat burnt clay element comprising a first main surface and a second main surface interconnected by a plurality of side-by-side ribs that form there with channels parallel both one to the other and to the main extension direction of the said burnt clay element, two of the said plurality of ribs defining the longitudinal sides of the said element, and characterized by the fact of comprising : a resistant part defined by the said first main surface and

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by at least the said two ribs that form the longitudinal sides of the said element, and an auxiliary part defined by the said second main surface and by the remaining ribs, the said resistant part having cross sections greater than  
5 those of the said auxiliary part.

Pared corners are advantageously provided in the areas of connection between the said resistant part and the said auxiliary part in order to encourage the separation one from  
10 the other of these.

Further characteristics and advantages will be seen more clearly from the description that follows of one preferred, though not sole, embodiment for the block according to the  
15 invention, illustrated purely as an unlimited example on the accompanying drawings, in which :

- Figure 1 shows, in a front view, the structure of the block forming the subject of the invention;
- 20 - Figure 2 shows, in a perspective view, the block illustrated in Figure 1 connected to a layer of concrete;
- Figure 3 shows, in a cross sectional view of a building structure, two resistant parts of the block illustrated in the preceding figures;
- 25 - Figures 4 and 5 show, in horizontal sectional views of a building structure, resistant parts of the block illustrated in Figures 1 and 2 positioned in the region of columns;
- Figure 6 shows, in a vertical sectional view of a building structure, the base area of a window, in particular  
30 where the horizontal element of the window is located;
- Figures 7 and 8 show, in horizontal sectional views of a building structure, the area where a vertical element of

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a wooden frame window is installed;

- Figure 9 shows, in a similar sectional view to those in Figures 7 and 8, the area where a vertical element of a metal frame window is installed.

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With reference to the above listed figures and, in particular to Figures 1 and 2, the block according to the invention is shown globally at 1. Constituted in a way in itself known by a flat burnt clay element, the block is provided with a first main surface 2 and a second main surface 3 that define the longest surfaces of the said element. The surfaces 2 and 3 are interconnected by a plurality of ribs subdivided into central ribs 4 and border ribs. The latter define the principal longitudinal sides 5 of the block 1. Running between the said ribs are channels 6 that are parallel both one to the other and to the main extension direction of the block 1.

An original aspect of the invention is that the block 1 is fundamentally subdivided into parts: namely a resistant part 7 and an auxiliary part 8. In the case illustrated, the resistant part 7 is defined by the first main surface 2 and by the longitudinal sides 5 of the block 1. The auxiliary part 8 is, instead, defined by the second main surface 3 and by the central ribs 4. The resistant part 7 has cross sections greater than and preferably double those of the said auxiliary part.

In actual practice, the resistant part 7 is essentially of a "U" shape that is interrupted only by localized enlargements in, out of preference, the region of the corners.

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Another original aspect envisages that in the areas of connection between the resistant part 7 and the auxiliary part 8 the separation of one part from the other be encouraged by the concavities shown at 9 that are preferably defined by recesses fashioned at the time the block is being made. The block, in common with burnt clay elements in general, is produced by simple extrusion.

The highly asymmetrical structure of the block 1 and the lack of difficulty in separating the resistant part 7 from the auxiliary part 8 influence considerably the possible uses to which the said block 1 can be put in the building trade and lead to the formation of building structures which, in themselves, are original.

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In the first place, as is shown in Figure 2, the block 1 can be utilized in the construction of horizontal frameworks. When employed in this way, the block 1 is used complete with all the parts thereof, and the resistance offered by the part 7 enables particularly light layers of concrete to be formed.

Apart from the said use, in itself of a conventional nature, the block 1 according to the invention can unconventionally be utilized to circumscribe pipework etcetera and for non-reutilizable structure shuttering.

As regards the circumscription of pipework etcetera (Figure 3), the block 1 is utilized removing therefrom the auxiliary block 8 and leaving there with the resistant part 7, with the typical "U" shape of this.

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As can be seen from the said figure, it is possible with the resistant part 7 to install all types of pipes etcetera 11 without these being bricked in or buried under the flooring. In this way, the heavy layer with which to level the flooring substructure is dispensed with, thereby reducing costs and overloads. Furthermore, it becomes possible in this way to inspect the pipework etcetera 11 and the installation thereof does not interfere with the work in hand (the laying of bricks and electrical/sanitary installations etcetera) since bricking in assistance is minimum.

The resistant parts 7 can be utilized for the circumscription not only of pipework etcetera in newly constructed buildings but also when old buildings are being restored and every time it is wished to update obsolete or deteriorated plants. In this way, the danger of breakages due to stray voltages and galvanic currents is eliminated and, above all, every one of the problems originated by the pre-existing constructional technique, in itself costly and erroneous from both a functional and a rational viewpoint, is obviated.

Figure 4 shows, in a plan view, the double columns 12, and Figure 5, a single column 12. The said columns or elements of support are delimited by resistant parts 7 that replace the customary shuttering. Thanks to this, the columns can be formed in a fast and simple way; furthermore, it is possible to leave open parts 13 that allow the concrete to spread and join, one to the other, two columns or to seal the spaces in between a column and the non-bearing wall 14.

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With the block 1 according to the invention it is possible to build framed structures that comply with the current re-

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quirements for aseismatic projects wherein the peripheral brickwork structural units can be rendered active with respect to the resistance and distribution of the shearing forces applied thereto.

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In particular, the blocks 1 allow the construction not only of a main frame defined by girders and columns but also of an auxiliary strengthening frame defined by the pillars 17 placed preferably in a position wherein able to form the vertical support elements of the windows, and by the cross beams 16 that can define the horizontal support elements of the windows.

In Figures 7 to 9 it can, in fact, be seen how the horizontal and vertical delimitation of the apertures 15 can lead, with the use of the resistant parts 7, to cross beams 16 and to pillars 17 that extend beyond the boundaries of the apertures 15 in order to define the said auxiliary frame, that is to say, a meshed structure that breaks up the area and notably increases the rigidity of the building structure.

With the peripheral strength thus created, the rigidity centre of gravity of the building is brought close to the masses thereby decreasing the incidence of torsion in the event of oscillations. This brings about a reduction in costs since the need to distribute the meshes in the frames becomes less important : when the spans of the peripheral columns and girders are fractionized and there is a considerable increase in the ductility and rigidity of these, a great percentage of the shearing forces is absorbed by the peripheral frames.

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In addition to a reduction in the costs of the structure, what is also achieved is the possibility to proceed more freely with a project since, for example, the cross section of the inside columns can be decreased and the said  
5 columns can be positioned more freely.

Furthermore, Figures 7, 8 and 9 show that the formation of the said auxiliary frame, in particular the pillars 17 that define the vertical elements of the windows, does not give  
10 rise to limitations in the shape of the said pillars. They can, in fact, extend in various ways compatibly with the required bracing action and with the type of frames (wooden 18 or metal 19) provided in the region of the apertures 15.

15 It should also be noted, again with reference to Figure 3, that with building structures comprising concrete parts 20 alternating with the said brickwork parts 14, the latter can be interconnected by the resistant parts 7 placed astride of the concrete parts 20, which can be girders 21, on the outside surface thereof.

In practice, the block 1, with the auxiliary part 8 removed, is placed in position at the same time as the non-bearing  
25 wall 14. The concrete 20 laid compresses and seals the said wall thereby eliminating the danger of flaws between this and the concrete part.

Thus the invention attains the objects proposed. Particu-  
30 lar stress is laid on the fact that the block according to the invention makes it possible to erect not only more rational and better organized building structures, as shown



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in Figure 3, but also building structures with which the essential advantage is achieved of the peripheral resistance being, at will, easily increased. The shearing forces applied to the inside frames are eliminated and this  
5 is beneficial to the architectural requirements since the use is possible of girders and pillars of a limited size, as well as of assymmetrical mesh frames.

The invention as described herein is liable to undergo numerous modifications and variants, all of which falling  
10 within the conceptual framework thereof.

Furthermore, all parts may be substituted with other technically equivalent elements and, in practice, the materials  
15 used, as also the shapes and sizes thereof, can be any to suit the needs.

## Claims:

1. Multiple use building trade block, of the type defined by a flat burnt clay element comprising a first main surface 2 and a second main surface 3 interconnected by a plurality of side-by-side ribs 4 that form there with channels 5 6 parallel both one to the other and to the main extension direction of the said burnt clay element, two of the said plurality of ribs defining the longitudinal sides 5 of the said element, and characterized by the fact of comprising : a resistant part 7 defined by the said first main surface 10 2 and by at least the said two ribs that form the longitudinal sides 5 of the said element, and an auxiliary part 8 defined by the said second main surface 3 and by the remaining ribs 4, the said resistant part 7 having cross sections greater than those of the auxiliary part 8.
- 15 2. Block according to Claim 1, characterized by the fact that in the areas of connection between the said resistant part 7 and the said auxiliary part 8 provision is made for concavities 9 for encouraging the separation, one from the 20 other, of the said parts.
3. Block according to Claim 1, characterized by the fact that the said resistant part 7 is, in the region of the corners thereof, provided with enlargements of the thickness 25 of the said resistant part 7.
4. Building structure utilizing the said block, characterized by the fact of comprising pipework etcetera 11 housing channels formed by a plurality of resistant parts 7 consecutive 30 utive one with respect to the other.

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5. Building structure according to Claim 4, characterized by the fact of comprising concrete elements and, in particular, columns 12 and girders 21, surrounded at least partially by the said resistant parts 7.

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6. Building structure according to Claim 5, characterized by the fact of comprising, in addition to the main external frame defined by girders 21 and columns 12, an auxiliary strengthening frame defined by pillars 17 placed, preferably, in a position whereby able to form the vertical elements of apertures 15, and by cross beams 16 that can define the horizontal elements of the said apertures 15, at least the said auxiliary frame being substantially made of reinforced concrete delimited by the said resistant parts 7..

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7. Building structure according to Claims 4, 5 and 6, of the type comprising concrete parts 20 alternating with brickwork parts 14, characterized by the fact that the said brickwork parts 14 are interconnected, astride of the said concrete parts 20 and on the outside of these, by the said resistant parts 7 of the blocks 1.

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1.

Multiple use building trade block and building structure  
utilizing the said block

The invention relates to a multiple use building trade block and to a building structure utilizing the said block.

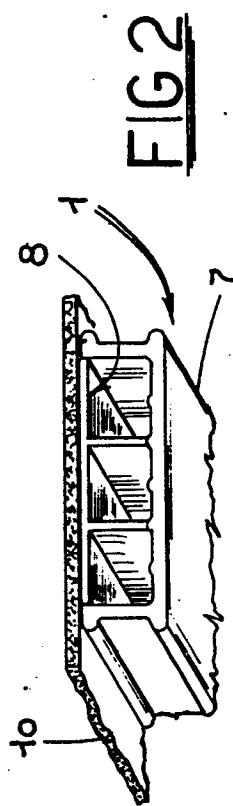
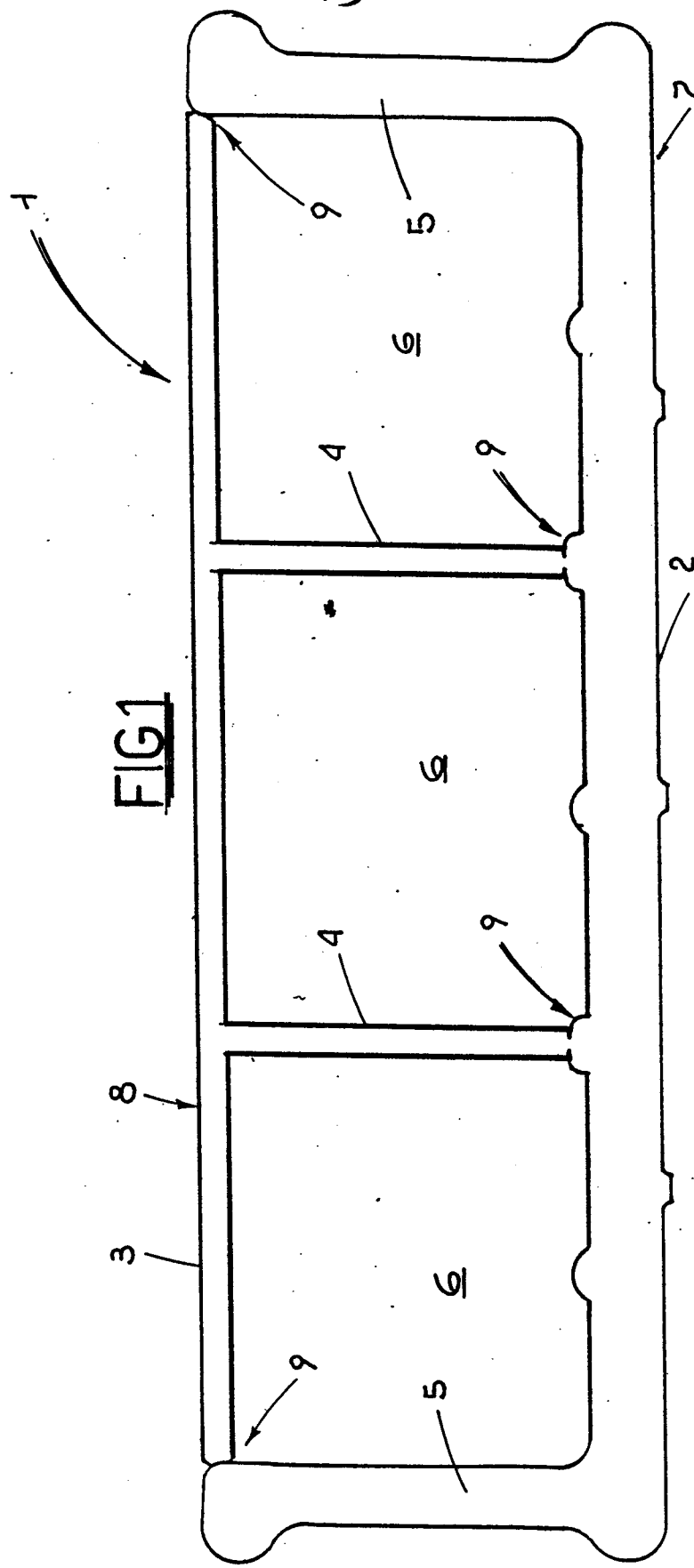
5 As is known, blocks are hollow burnt clay elements of standard sizes used prevalently in the construction of horizontal frameworks and, in particular, for tile lintel or steel and tile floors.

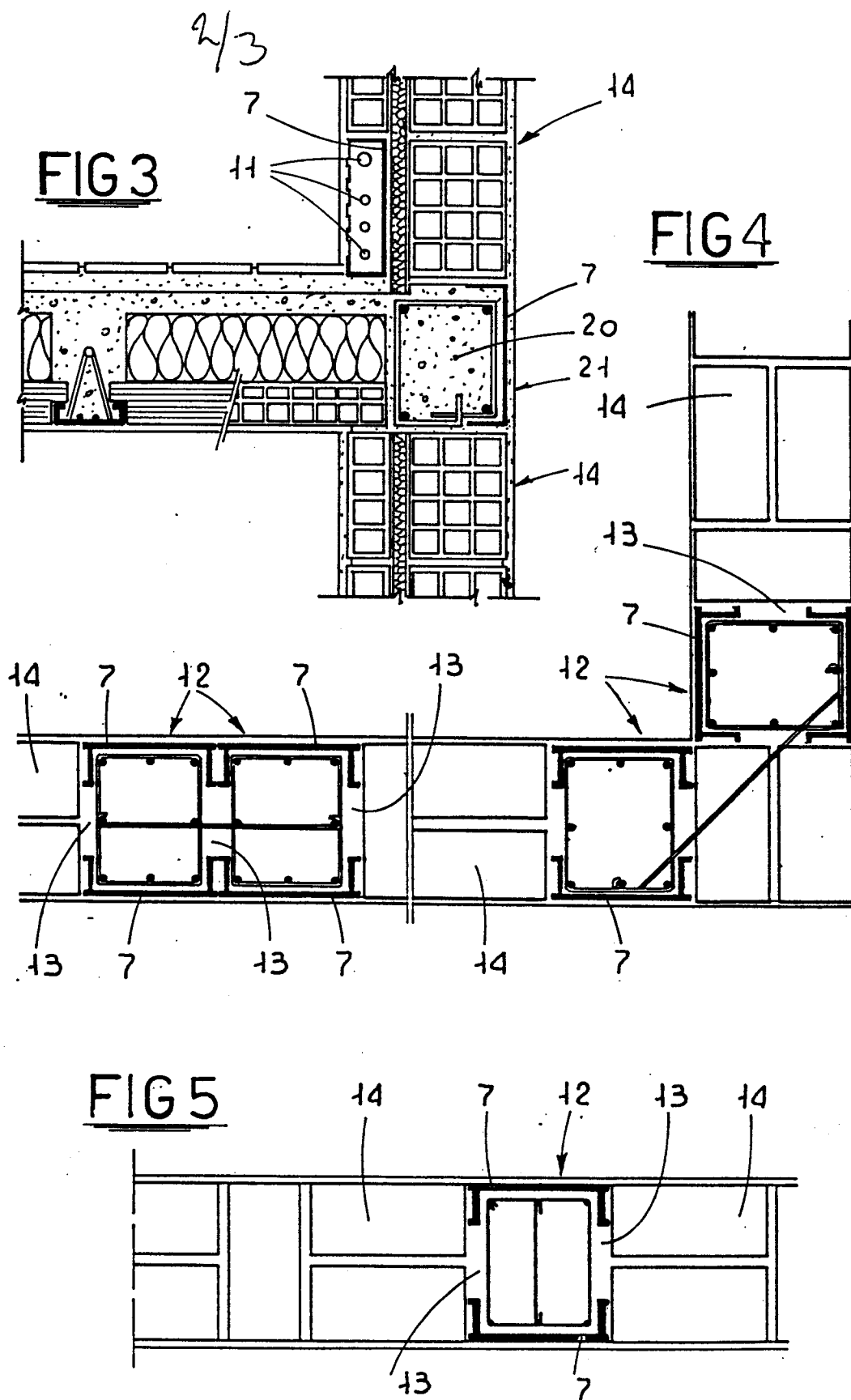
10 Those in use at present are, in practice, defined by two main surfaces connected one to the other by ribs perpendicular thereto and also defining, at the lateral extremities, the principal longitudinal sides of the blocks.

15 Thus the overall structure is perfectly symmetrical and, indicatively, lengths of around one metre, widths of a few tenths of a centimetre, and gauges in the region of ten centimetres are envisaged.

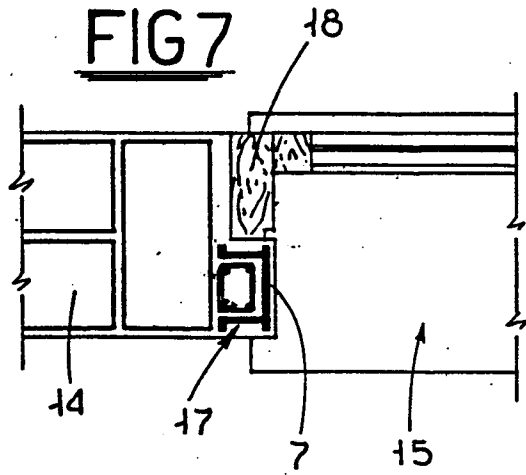
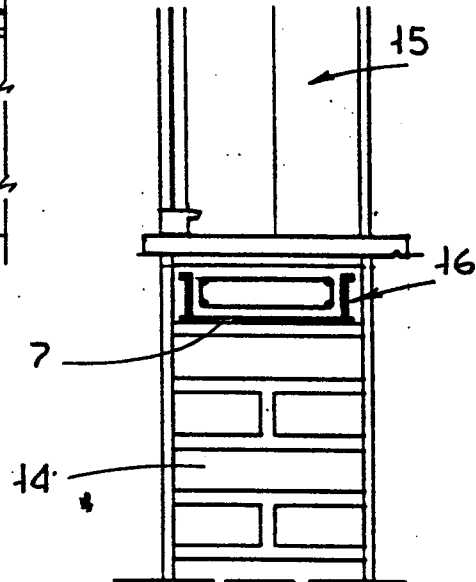
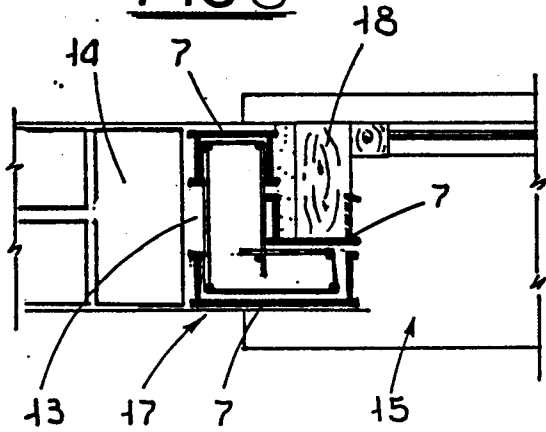
20 The blocks described summarily above are satisfactory for the use stated (namely the construction of horizontal carrying structures) but fail to meet the requirements for uses of a different nature. In particular, the above described blocks are also unsuitable for those uses that, on general lines, would appear to fall in line with the ample, substantially hollow, conformation thereof. For example: in building structures it is useful to create channels in which to house pipes etcetera, so as to prevent these from being either bricked in or buried underneath the flooring, as is generally the case. Furthermore, the concrete parts in

1/3





3/3

FIG 7FIG 6FIG 8FIG 9