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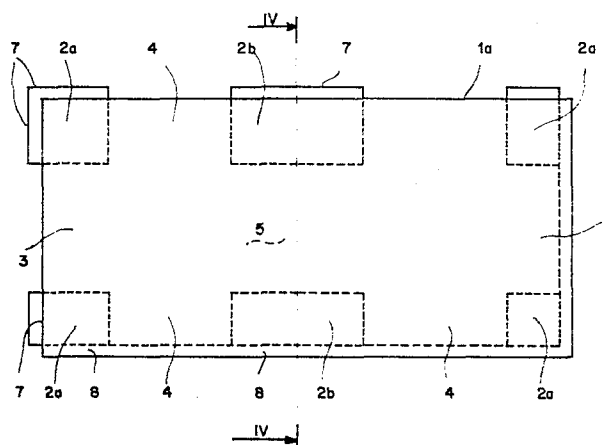
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(54) **Procedure and prefabricated modular elements for the construction of partition and curtain walls for use inside buildings.**

(57) A prefabricated modular element for constructing partitions and curtain walls, for use inside buildings formed by two brick layers (1a, 1b) connected and spaced apart by plaster septa (2), the last material also forming the outer coating (6) of said layers. The septa (2a, 2b) are shaped and arranged so as to form complementary members (7, 8) for fixed-joint connection of the modular elements to each other. The spacing of the septa is designed so as to allow laying the electrical cables and/or water mains and similar services. The use of said prefabricated modular elements results in easier and more economical procedure for the erection of double walls with respect to known techniques.



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Procedure and prefabricated modular elements for the construction of partition and curtain walls for use inside buildings.

The present invention relates to prefabricated modular elements for the construction of internal dividing walls, called partitions, and the internal faces of curtain walls of buildings.

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The invention also concerns a procedure for the construction of said partitions and internal faces with the abovementioned prefabricated modular elements.

10 Present-day technique for the construction of partitions and curtain walls which can offer good characteristics with regard to sound and thermal insulation, mechanical resistance to breakthrough, high resistance to fire and low resistance to the diffusion of vapor and high thermal inertia, generally makes use of a double wall in
15 brick, the interspace of which is or is not filled with non-conducting material.

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5 The mode of operation described above presents a double
array of disadvantages: on the one hand difficult execu-
tion, since two walls instead of one must be erected
and moreover plastered in order to give them an adequa-
te degree of surface finish; on the other an appreciable
encumbrance and therefore waste of usable space, due
to the double walls which, in order to be able to dis-
play the abovementioned characteristics, must be built of
brick elements each at least 6 cm thick. It is clear
10 that the disadvantages listed above, connected with the
erection of double walls, are a negative factor as regards
the cost of construction, as more time and more material
are needed than for the erection of a single wall.

15 Various types of prefabricated elements, even in panel
form, for example with a perforated brick core and plas-
ter coating, have been proposed and marketed as solutions
to the abovementioned problems. However, all the partitions
in brick and plaster available until now on the market
20 use a single brick element which cannot provide a conti-
nuous interspace that can be used for running hydraulic
or electric lines and/or for containing sound-insulation
materials; therefore, the plastering and one layer of
the brick of the finished wall must be broken into.

25 One object of the present invention is to provide a pre-
fabricated modular element for the construction of divid-
ing and curtain walls for interiors of buildings which
will eliminate the abovementioned disadvantages.

30 One characteristic of the prefabricated modular element,
object of the present invention, is the fact that it is
composed of two thin elements in brick with a space be-
tween them, coupled by means of a suitable binding mate-
35 rial: in particular, plaster. Said binding material, a-
side from covering the outside faces of said brick ele-
ments, also forms one or more septa between the two

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brick elements, without solution of continuity with their external coating; said septa both space out the two brick elements and provide for their reciprocal connection. The abovementioned septa are, in particular, set
5 along limited perimetral portions of said modular element so that an empty space, useful for the passage of hydraulic and electrical systems and for incrementing sound and thermal insulation, is left inside it.

10 Another characteristic of the modular element object of the present invention is the fact that the abovementioned connecting septa are so designed as to function as complementary members for fixed-joint connection of the various elements. In fact, some septa of each modular element
15 protrude with respect to its profile, and others form recesses designed to accommodate the protruding parts of the adjacent elements.

Another object of the present invention is to provide a
20 procedure for the construction of partitions and/or curtain walls of buildings, which, as it foresees the use of the abovementioned prefabricated modular elements, will be much more simple and economical with respect to those presently in use. In fact, a double wall can be
25 constructed in a single operation, which consists in laying said prefabricated modular elements side-by-side in both the lateral and end-to-end senses and interposing, if necessary, a binding material along the joints. If necessary suitable material and even a metal framework
30 may be placed in the interspace. The resulting external surfaces may be then covered with a thin layer of finishing material.

Therefore, according to the invention, a prefabricated
35 modular element for the construction of partitions and/or curtain walls for buildings is provided, characterized by the fact of being composed of two flat, parallel

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walls in resistant material, connected to each other by means of septa in a binding material which also forms the external coating of said elements; said septa also form projections, or, in correspondence, recesses with respect to the perimetral profile of said prefabricated element.

Other characteristics, as well as the advantages, of the prefabricated modular element object of the present invention will be clearer from the following description of a preferred embodiment, described as an example and in no way limiting, with reference to the accompanying drawings, in which:

Figure 1 is a side view of the modular element made in accordance with the present invention;

Figures 2 and 3 are, respectively, a lower plan view and upper plan view of the modular element shown in Figure 1;

Figure 4 is a cross-sectional view of the modular element along arrows IV-IV of Figure 1;

Figures 5 and 6 are two views, from right and left respectively, of the modular element shown in Figure 1.

With reference to the abovesited figures, a prefabricated modular element, according to the present invention, is composed of two flat, parallel bricks, indicated as 1a and 1b and of essentially parallelepipedon form, held together, at a pre-determined distance, by the septa 2 in plaster. The present example of embodiment foresees four angular septa 2a in correspondence to the corners of the two brick elements, and two center septa 2b in correspondence to the median portion of the two longer sides, which thus define longitudinal passage 3 and transversal passage 4 between said septa toward a

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chamber 5 bounded by the inside faces of said bricks 1a and 1b.

5 The outside faces of the two bricks 1a and 1b are suitably coated in the same material of which septa 2 are made; said coating indicated as 6 in Figure 4, forms a single body with said septa 2. As has already been said with reference to the present example of embodiment, the material chosen for both the coating 6 and the
10 septa 2 is plaster, if necessary a special type, highly dehydrated in order to increase its resistance and with special additives to improve its other technical characteristics.

15 In order to ensure easy connection between the various prefabricated modular elements when the wall is being built, the septa 2 are so formed as to constitute not only spacing elements between the two bricks, but also complementary male and female members for fixed-joint
20 connection. In the prefabricated modular element shown in Figure 1 the two median septa 2b are made in such a way that while one presents a protrubance 7 with respect to the profile of the element itself, the other, on the opposite major face, forms a corresponding recess 8 with
25 dimensions suitable for seating a protrubance 7 of an adjacent prefabricated element. Likewise, the angular septa 2a present analogous protrubrances 7 and recesses 8, to the same end. In particular, to consent also staggered joining of two prefabricated modular elements one
30 with respect to the other, the length of the median septa 2b is substantially double that of the angular septa 2a. In the practical embodiment of the invention, said prefabricated modular element may be realized, for example, by casting with the binder in the fluid state in
35 suitable molds in which the two brick elements have been pre-positioned. Said modular element can be constructed in any suitable size, and in particular, advantageously,

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in the format 0.30 X 0.60 m, without excluding the possibility of realizing, on the basis of the same principle, modular panels in the formats 0.5 X 2.7 m and/or 0.6 X 2.7 m.

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Thanks to the longitudinal and transversal passages 3 and 4, it is possible to lay hydraulic system piping and electrical plant cables without having to again break into the wall once it is finished. These passages also
10 allow for filling the interspace 5 with sound-absorbing or heat-insulating materials, or if necessary for introducing a metal reinforcement. Finally, the longitudinal and transversal passages 3 and 4 offer the advantage, accessory but not negligible, of allowing for easy, safe
15 handling of the modular element by the mason during installation, since he can place his hands inside and thus better support the weight. Since the external faces of the modular element are covered with plaster, the resulting wall is already plastered and the only further operations necessary will be those of stuccoing the cracks
20 between one modular element and another and surface finishing, if required. The internal faces of the modular elements are not, instead, plastered, to avoid danger of corrosion to the hydraulic systems which may be present, often caused by contact with plaster.
25

The advantages offered by the prefabricated modular element according to the present invention with respect to panels in brick and plaster according to known techniques, noted above, are evident. In these last, in fact,
30 the lack of omnidirectionally-communicating passages makes reinforcement of the wall and introduction of insulating material and foam, if so required, impossible. The walls built with the prefabricated modular elements according to the present invention present a higher acoustic damping power, since they are formed by four
35 septa of brick in series instead of two.

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They also present a higher grade of thermal insulation because, differently from traditional panels, they do not have transversal brick septa which form thermal bridges, and they do not permit the formation of convective
5 air currents in the interspace, as the passages are extremely small (1.5 to 1.8 cm against 3.5 to 4.0 cm in known panels).

Finally, the prefabricated modular element is much more
10 manageable than known panels. The lack of opening in these last make handling more laborious: they can be grasped only by friction and automation, if desired, of the phase of transfer from the pallets to the height of the wall where the mason is working is not possible.

15 Naturally the prefabricated modular element object of the present invention can be constructed in materials different from those described above, and other variations and modifications may be made without departing
20 from the object of the invention as such.

CLAIMS

1. A prefabricated modular element for constructing partitions and curtain walls for use inside buildings, characterized by its being formed by two walls (1a, 1b) in resistant material, flat and parallel and connected by connecting septa (2a, 2b), formed by casting with a binding material which also forms their outer covering, said septa having protrubrances (7) and corresponding recesses (8) with respect to the perimetral profile of said prefabricated element.
2. A prefabricated modular element according to claim 1, wherein said two walls (1a, 1b) in resistant material are constituted of two brick elements.
3. A prefabricated modular element according to claim 1, wherein said binding material for the connecting septa (2a, 2b) and for the external covering is plaster.
4. A prefabricated modular element according to the previous claims, wherein said protrubrances (7) and said recesses (8) formed by said connecting septa (2a, 2b) are designed to constitute complementary male and female members for fixed-joint connection with adjacent and/or overlooking prefabricated modular elements.
5. A prefabricated modular element according to the previous claims, wherein said connecting septa (2a, 2b) define longitudinal (3) and transversal passages (4), useful for laying electrical cables and/or water mains and similar services.
6. A prefabricated modular element according to the previous claims, wherein said walls (1a, 1b), connected and spaced by said connecting septa, define between them a chamber (5) to be used to contain any metal reinforce-

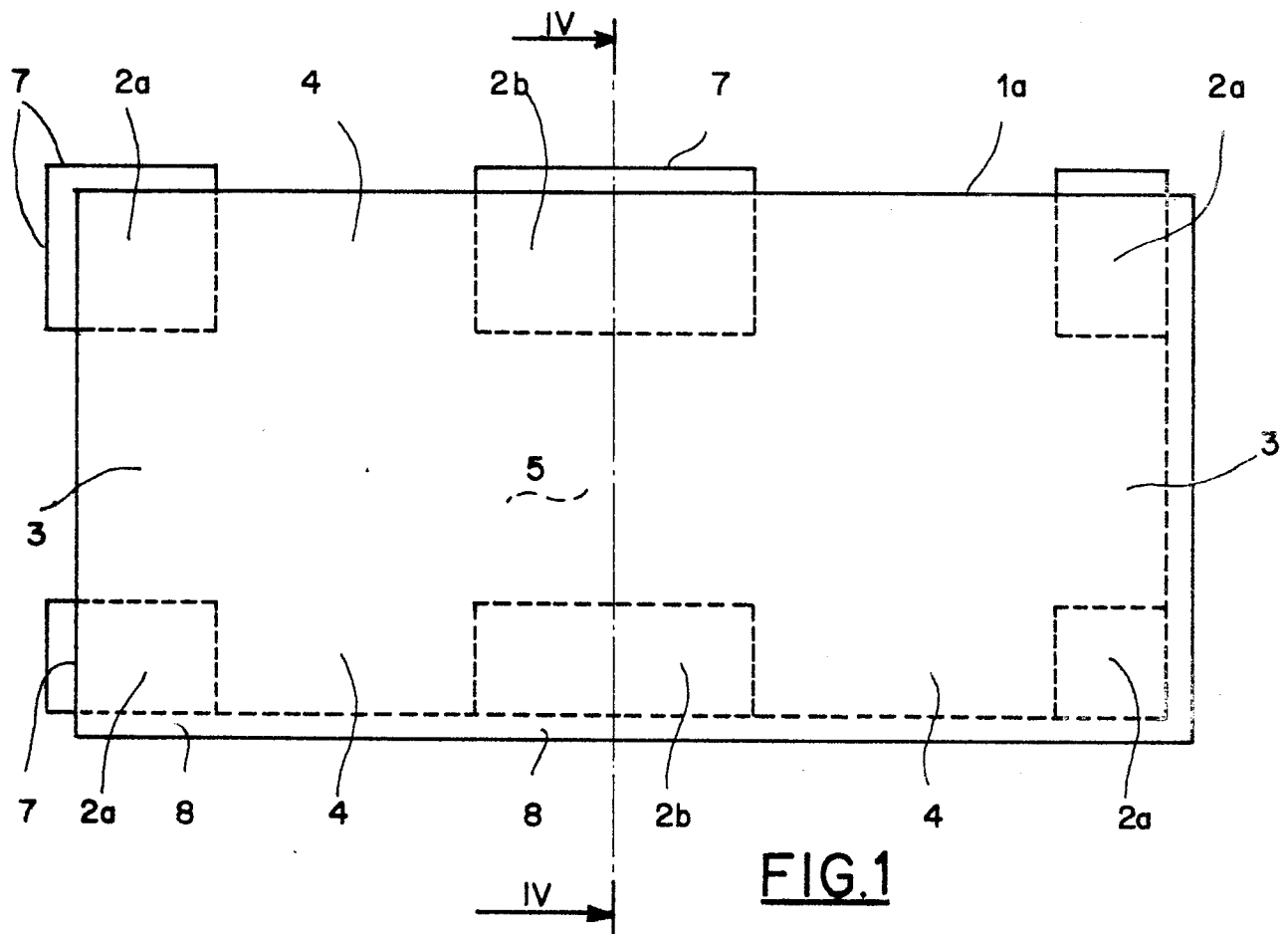
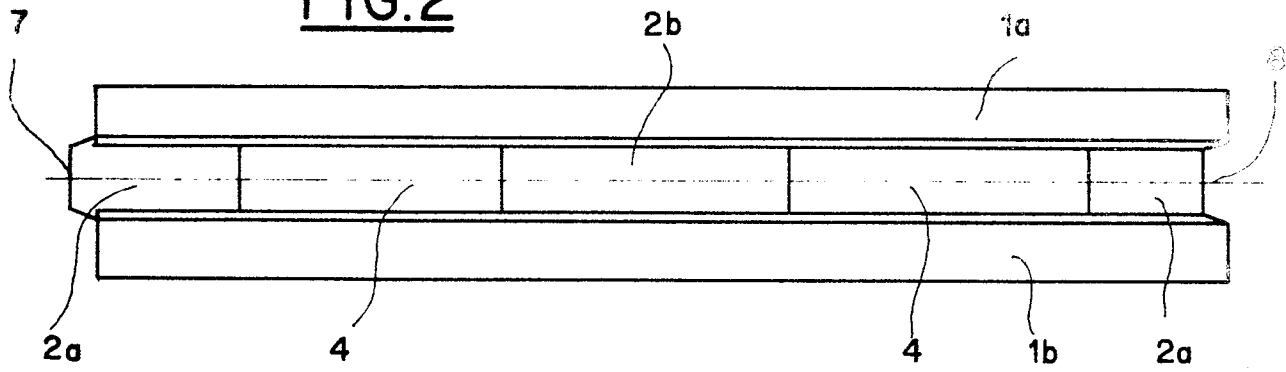
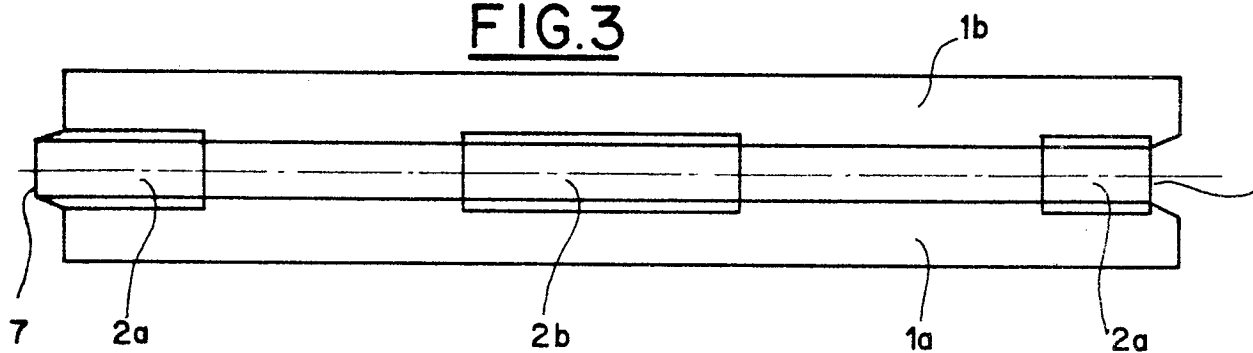
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ments necessary and to be filled, if desired, with sound-absorbing, heat-insulating, and similar materials.

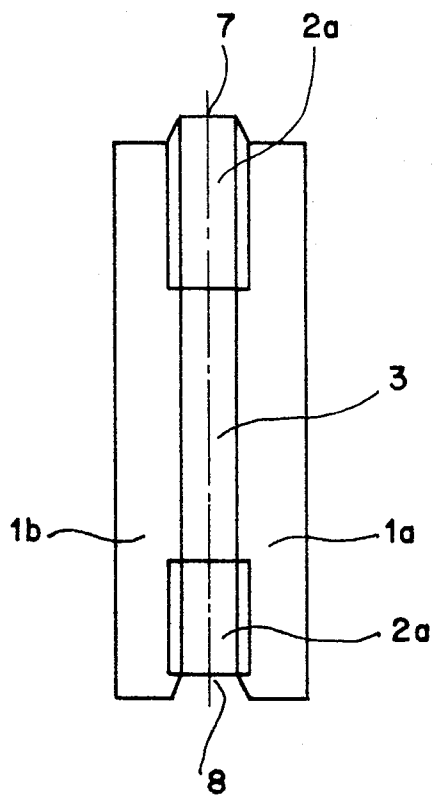
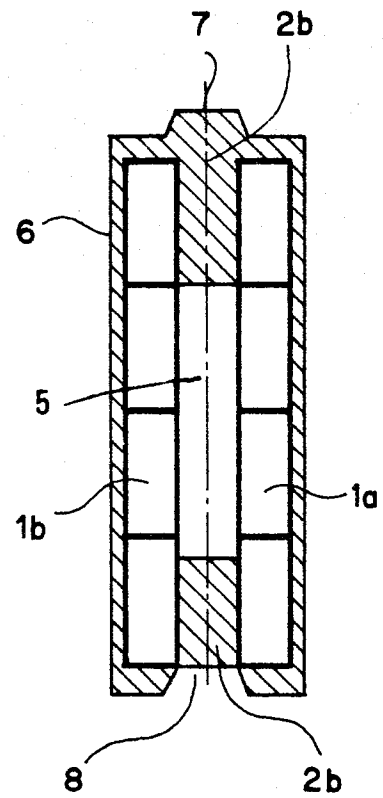
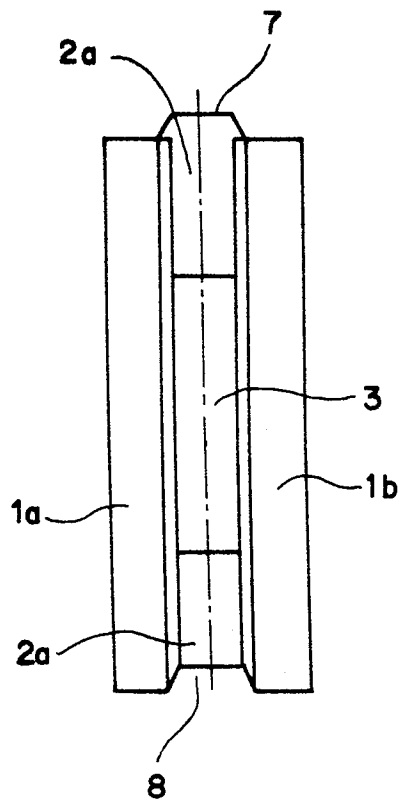
5 7. A procedure for the installation of partitions and/or curtain walls for use inside buildings, characterized by the fact that it includes the installation of prefabricated modular elements, according to any one of the previous claims, in a side-by-side or end-to-end arrangement, with the interposition of a binder, if necessary, along
10 the joints.

8. A procedure according to claim 7, which also includes an operation comprising sealing and the injection of a filler material, after setting a metal reinforcement,
15 if used, into the chamber (5) defined by the walls (1a, 1b) of said prefabricated modular element.

9. A procedure according to claims 7 and 8, characterized by the fact that it also includes an operation comprising the application of an external covering to the
20 wall resulting from the combination of said prefabricated modular elements, said covering being a layer of finishing material.

FIG.2**FIG.1****FIG.3**

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FIG. 5FIG. 4FIG. 6