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(54) CONSTRUCTIVE ARRANGEMENT

(57) A constructive arrangement with a first row (1) horizontal and at least one upper row (2) of prefabricated modules (3). Within each row, each module (3) comprises a floor (17) and/or a ceiling and a plurality of side walls (5, 5'); at least one side wall (5, 5') is in contact with a side wall (5, 5') of another module (3); each module (3) comprises at least two vertical conduits (4) traversing at least one side wall (5, 5'); the constructive arrangement comprises at least two vertical securing channels (12) traversed by securing cables (13), formed by an alignment of vertical conduits (4); each module (3) comprises at least two horizontal conduits (16) traversing side walls (5, 5'), ceiling or floor (17); the constructive arrangement comprises at least two horizontal securing channels (20) traversed by securing cables (13), formed by an alignment of horizontal conduits (16).

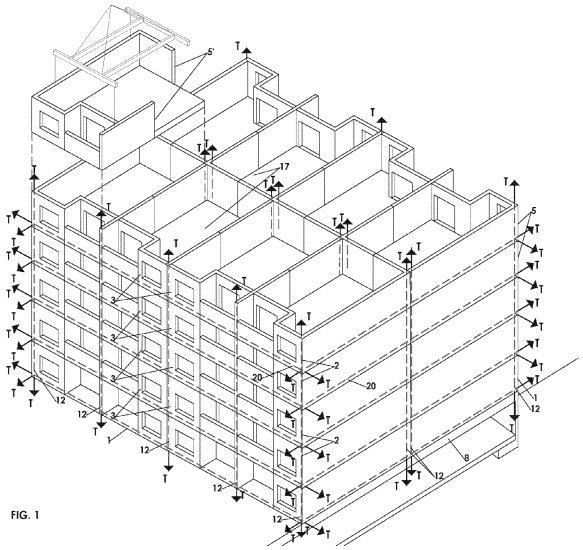

FIG. 1

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Description

Purpose of the invention

[0001] The present invention relates to a constructive arrangement based on three-dimensional and prefabricated modules of reinforced concrete, steel, a combination of reinforced concrete and steel or other material (e.g. composite material).

[0002] The constructive arrangement object of the present invention allows the construction of buildings in heights greater than two floors using said prefabricated modules.

[0003] The constructive arrangement object of the present invention is applicable in the field related to the design and manufacture of three-dimensional prefabricated modules of reinforced concrete, steel, a combination of reinforced concrete and steel or other material for construction, as well as in the construction of buildings for any use.

Background of the invention and technical problem to be solved

[0004] The use of prefabricated modules (either of concrete or metal or of a composite material) for construction is becoming increasingly popular due to the cost savings on site and the shortening of construction times, as well as the improvement of the quality of the finishes that this type of prefabricated solution provides.

[0005] One of the limitations of building constructions based on prefabricated modules is the instability of high-rise buildings based on this type of prefabricated module. In fact, in case of horizontal stresses caused by strong winds or by seismic movements, buildings based on prefabricated modules do not offer much safety when built above two heights.

[0006] There are currently some constructive solutions, as shown in document US 4059931 A, which try to provide a solution to the problem of construction at height with precast concrete modules. However, in the solution proposed in said document, it is necessary to use a reticular frame that creates a series of interstices or niches where the precast concrete modules are inserted. Such a solution, therefore, involves the manufacture and assembly of the reticular frame in addition to the concrete modules, and complicates the installation of the concrete modules on site. Likewise, the solution implies the creation of "dead" or underutilized spaces between the concrete modules.

[0007] The solution proposed in US 3503170 A is also known, wherein a plurality of precast concrete modules are stacked in a zigzag or staggered arrangement. On a row of precast concrete modules separated by intermediate spaces, another row of precast concrete modules is arranged, each precast concrete module of the second row being arranged above an intermediate space of the first row and resting on two precast concrete modules of the first row. Concrete modules at different heights are secured vertically by post-tensioning with steel cables. This solution has the drawback of wasting a lot of space between every two precast concrete modules in each of the rows, while the vertical post-tensioning is not enough to guarantee the resistance of the structure against winds and earthquakes.

Description of the invention

[0008] In order to remedy the aforementioned drawbacks, the present invention relates to a constructive arrangement.

[0009] The constructive arrangement that is the object of the present invention comprises at least one first horizontal row of prefabricated modules at ground level and at least one upper horizontal row of prefabricated modules disposed on a lower row and/or on the at least one first horizontal row of prefabricated modules.

[0010] Several horizontal rows of prefabricated modules arranged in parallel form a complete level of the constructive arrangement.

[0011] Each row of prefabricated modules comprises at least one prefabricated module located at a first end of the row and one prefabricated module located at a second end of the row.

[0012] In a novel manner, in the constructive arrangement object of the present invention:

- within each row, each prefabricated module comprises a floor and/or a ceiling and a plurality of side walls; wherein at least one side wall is in contact with a side wall of another prefabricated module of said row;
- each prefabricated module of an upper row comprises a lower perimeter edge in contact with an upper perimeter edge of a prefabricated module of a lower row;
- each prefabricated module comprises at least two vertical conduits, wherein each vertical conduit runs through at least one side wall of the prefabricated module;
- the constructive arrangement comprises at least two vertical securing channels, wherein each vertical securing channel is formed by an alignment of vertical conduits;
- each prefabricated module comprises at least two horizontal conduits, wherein each horizontal conduit runs through at least one side wall, ceiling or floor of the prefabricated module;
- the constructive arrangement comprises at least two horizontal securing channels, wherein each horizontal securing channel is formed by an alignment of

horizontal conduits;

- wherein each vertical securing channel is traversed by a securing cable and comprises anchoring elements for the vertical tension securing of a set of prefabricated modules, and;

- each horizontal securing channel is traversed by a securing cable and comprises anchoring elements for the horizontal tension securing of a set of prefabricated modules.

[0013] By means of the constructive arrangement described above, it is possible to provide great stability of the structure formed by prefabricated modules against all types of stresses, most importantly providing stability before horizontal stresses such as strong winds or seismic movements, since the set of prefabricated modules, by combining vertical securing and horizontal securing, behaves as a monolithic structure, thus avoiding the relative displacements of some modules with respect to others. Thus, the building can resist the whole of the action by itself, or transmit the horizontal actions of the whole of the building or to a vertical core resistant to such actions.

[0014] Moreover, this feature becomes particularly important for construction arrangements with three or more horizontal rows of prefabricated modules, arranged one above the other.

[0015] Preferably, in each prefabricated module of an upper row, the entire surface of the lower perimeter edge is in contact with substantially the entire surface of the upper perimeter edge of a prefabricated module of a lower row.

[0016] According to a preferred embodiment, the upper perimeter edge is an upper extension of the sidewalls of the prefabricated module. Also preferably, the lower perimeter edge is a lower extension of the side walls of the prefabricated module.

[0017] According to a possible embodiment, each prefabricated module comprises at least one truncated sidewall covering only a partial portion of the total length of the side of the module.

[0018] In view of the foregoing, according to a possible embodiment, within each horizontal row each prefabricated module comprises at least one truncated sidewall, which in turn comprises a ridge that is in contact with a ridge of a truncated sidewall of an adjacent prefabricated module of said horizontal row.

[0019] The aforementioned features provide a structure of great compactness, allowing an efficient use of the volume of the entire constructive arrangement.

[0020] According to a possible embodiment, each prefabricated module comprises at least one horizontal conduit in a certain direction and another horizontal conduit in another direction, such that the constructive arrangement comprises at least two horizontal securing channels in two different horizontal directions, wherein each horizontal securing channel is formed by an alignment of horizontal conduits.

[0021] It is thus possible for the horizontal securing of the constructive arrangement to take place in two different horizontal directions, thus providing an enormous stability and monolithic nature to the constructive arrangement as a whole.

[0022] According to a possible embodiment, the two horizontal directions of the horizontal conduits of each prefabricated module are mutually perpendicular.

[0023] Also, according to a possible embodiment, each prefabricated module comprises a parallelepipedic geometry.

[0024] Preferably, each vertical conduit and each horizontal conduit is covered by a metal sheath. This is especially useful in the case of prefabricated concrete modules. Said sheath may also be made of PVC or other plastic material.

[0025] Also preferably, the upper end of each vertical conduit comprises an upper recess. This makes it possible to place, in the upper recesses located on the upper end of each vertical securing channel, the corresponding anchoring and tensioning elements for the vertical tension securing of the set of prefabricated modules.

[0026] According to a possible embodiment, the lower end of each vertical conduit comprises a lower recess.

[0027] Also, according to a possible embodiment, the constructive arrangement comprises a lower slab or foundation located below the first row of prefabricated modules, where the slab or foundation comprises holes at its top and lower recesses at its bottom in correspondence with the holes, where the holes are configured to coincide with the arrangement of the vertical securing channels.

[0028] Either on the lower slab, or on the lower end of each vertical conduit, the lower recesses make it possible to place, at the lower end of each vertical securing channel, the corresponding anchoring elements for the vertical securing of the set of prefabricated modules.

[0029] According to a possible embodiment, a first end of each horizontal conduit comprises a lateral recess.

[0030] Also according to a possible embodiment, a second end of each horizontal conduit comprises a lateral recess.

[0031] These lateral recesses of the horizontal conduits make it possible, at the ends of each horizontal securing channel, to place the corresponding anchoring and tensioning elements for the horizontal tension securing of the set of prefabricated modules.

[0032] Preferably, each recess is covered with a metal drawer. This is especially useful in the case of prefabricated concrete modules.

[0033] According to a preferred embodiment, the prefabricated modules comprise on an upper edge of their sidewalls and/or on a lower edge of their sidewalls one or more steps, wherein the steps of the upper edge of the sidewalls have a geometry complementary to the steps of the lower edge of the sidewalls, so as to facilitate

the positioning and stability of some prefabricated modules mounted on others. Also, this feature helps to preserve the tightness in the façade modules of the constructive arrangement, specifically in the side walls facing the façade in the prefabricated façade modules of the constructive arrangement.

[0034] This feature facilitates the assembly of the prefabricated modules, one on top of the other, and also provides stability against vibrations, and helps (together with tension securing) to avoid displacements of the prefabricated modules relative to each other.

[0035] Preferably, a neoprene pad is arranged in the steps, configured to offer a soft contact between two prefabricated modules, located one on top of the other. This allows to dampen vibrations and absorb possible dilations of the prefabricated modules.

[0036] According to one embodiment of the invention, the constructive arrangement comprises an auxiliary metal structure configured to prop up the side walls of each prefabricated module, as well as configured to support a false ceiling of each prefabricated module and serve as a support to the facilities of the building.

Brief description of the figures

[0037] As part of the explanation of at least one embodiment of the invention the following figures have been included.

Figure 1: It shows a schematic view of an embodiment of the constructive arrangement according to the present invention, where several stacked rows of prefabricated modules are shown wherein, with the exception of the prefabricated modules located in the first row at ground level, each prefabricated module of the upper rows supports the entire surface of a lower perimeter edge on the entire surface of an upper perimeter edge of a prefabricated module of the row immediately beneath it.

Figure 2: It shows a schematic view of a detail of the vertical securing between prefabricated modules of different rows, according to a possible embodiment of the present invention.

Figure 3a: It shows a schematic view of a detail of the horizontal securing between prefabricated modules of the same row, according to a possible embodiment of the present invention.

Figure 3b: It shows a view according to section AA indicated in Figure 3a, where a detail of the edge of a truncated side wall of the prefabricated module is observed, according to a possible embodiment of the present invention.

Figure 4: Shows a schematic view of an embodiment of the constructive arrangement, wherein the auxiliary metal structure is observed.

Detailed description

[0038] The present invention refers, as mentioned above, to a constructive arrangement.

[0039] Figure 1 shows an example embodiment of the constructive arrangement of the invention, wherein a first row (1) of adjacent prefabricated modules (3) is shown. On top of this first row (1), located at the base (at ground level) of the constructive arrangement, there are several upper rows (2) of prefabricated modules (3).

[0040] Each prefabricated module (3) comprises a floor (17) and/or a ceiling (in Figure 1, the prefabricated modules (3) lack a ceiling), as well as side walls (5).

[0041] The side walls (5) extend below the floor (17) and/or above the ceiling of each prefabricated module (3), forming respective upper and lower skirting boards or perimeter edges (18).

[0042] As can be seen in Figure 1, each prefabricated module (3) of the upper rows (2) is arranged with its entire lower perimeter edge (18) resting on the entire upper perimeter edge (18) of the same prefabricated module (3) of the row immediately beneath it.

[0043] To allow two or more rows of prefabricated modules (3) to be stacked on the first row (1) of prefabricated modules, so that the constructive arrangement is stable against horizontal stresses (for example due to strong winds that hit the constructive arrangement or seismic movements in the ground), the prefabricated modules (3), once placed in their corresponding place within the constructive arrangement, are subjected to a vertical tension securing and a horizontal tension securing by means of steel tie cables (13).

[0044] In this way, the entire constructive arrangement behaves as a monolithic assembly, thus achieving a great stability of the prefabricated modules (3) of the upper rows (2), making it practically impossible to move said prefabricated modules (3) of the upper rows (2) with respect to the modules (3) of the immediately lower rows or of the first row (1) of prefabricated modules (3) located at the base.

[0045] Figure 2 schematically shows the vertical securing, according to a possible embodiment of the constructive arrangement object of the present invention.

[0046] As shown in Figure 2, each prefabricated module (3) comprises at least one vertical conduit (4) traversing, from top to bottom, at least two opposite sidewalls (5) of each prefabricated module (3).

[0047] According to a possible embodiment, in some of the prefabricated modules (specifically in the prefabricated modules (3) intended to occupy the upper end row of the constructive arrangement), at the top of each vertical conduit (4) there is an upper widening or recess (6). Alternatively, according to another possible embodiment, all prefabricated modules (3) comprise said upper recess (6) at the top of each vertical conduit (4).

[0048] Also, according to a possible embodiment, in

some of the prefabricated modules (specifically in the prefabricated modules (3) intended to occupy the first row (1) located at the base of the constructive arrangement, at ground level), at the bottom of each vertical conduit (4) there is a lower widening or recess (7). Alternatively, according to another possible embodiment, all the prefabricated modules (3) comprise said lower recess (7) at the bottom of each vertical conduit (4). Alternatively, according to another possible embodiment, the lower recesses (7) are made on a slab (8) that makes up the floor on which the prefabricated modules (3) sit, so that the vertical conduits (4) of the prefabricated modules (3) of the first row (1) located at the base of the constructive arrangement are located in correspondence with a series of holes (9) of the slab (8) that makes up the floor, the lower recesses (7) being located by the bottom of the slab (8), in correspondence with the holes (9) of the slab (8).

[0049] The vertical conduit (4) (with the exception of the upper and lower recesses (6, 7), if any) of each prefabricated module (3) is covered with a metal sheath (10) (optionally, said sheath could be made of PVC or other material). In addition, each upper and lower recess (6, 7) (if any, either in a prefabricated module (3) and/or in the slab (8) that makes up the floor) is covered by a metal drawer (11) that has a hole in its bottom.

[0050] When the prefabricated modules (3) are arranged in horizontal rows of modules (3), located one above the other, each vertical conduit (4) in each side wall (5) of a prefabricated module (3) of the upper rows (2) is located in correspondence with a corresponding vertical conduit (4) of a prefabricated module (3) of the row immediately beneath it. Each alignment of vertical conduits (4) of different prefabricated modules (3), located one above the other, forms a vertical securing channel (12).

[0051] A tendon or securing cable (13) is arranged inside each vertical tether channel (12), configured to actively vertically tension the prefabricated modules (3) that it crosses, thereby exerting a vertical pressure of some prefabricated modules (3) against others, thus ensuring that each vertical column of prefabricated modules (3) behaves as a monolithic assembly.

[0052] In the upper recess (6) of each vertical conduit (4) of the prefabricated modules (3) located in the extreme upper row of the constructive arrangement (that is, in the upper recess (6) of each vertical channel (12) of securing) there are arranged first anchoring elements (14) of the corresponding securing cable (13).

[0053] Likewise, in the lower recess (7) of each vertical securing channel (12) (either in the lower recess (7) in the lower part of the slab (8) that makes up the floor or in the lower recess (7) of each vertical conduit (4) of the prefabricated modules (3) located in the first row (1) located at the base of the constructive arrangement, at ground level) there are arranged second securing elements (15) of the corresponding securing cable (13).

[0054] According to a possible embodiment, the first securing elements (14) are active securing elements while the second securing elements (15) are passive securing elements. In this way, the passive securing elements are arranged in the lower recess (7) of the vertical securing channels (12) and, by passing the securing cable (13) along each vertical securing channel (12), the securing cable (13) is tensioned by means of active securing elements located in the upper recess (6) of each vertical conduit (4) of the prefabricated modules (3) located in the upper end row of the constructive arrangement. Alternatively, the first securing elements (14) may be passive elements and the second securing elements (15) may be active elements .

[0055] Figure 3a schematically shows the horizontal securing, according to a possible embodiment of the constructive arrangement object of the present invention.

[0056] In Figure 3b, a detail of the edge of a truncated side wall (5') is shown. This ridge comprises a recess (24) configured to coincide with another recess (24) of another truncated side wall (5') of another adjacent prefabricated module (3) of the same horizontal row. The edges of the truncated side walls (5') are joined by a neoprene joint or tape. In the gap created by the recesses (24) of both edges of the truncated side walls (5'), a rubber joint or strip is arranged. When the truncated side walls (5') are located on the façade of the constructive arrangement, the edges of the truncated side walls (5') are sealed, on their outer edge on the fagade, by a silicone gasket.

[0057] Preferably, the horizontal securing of the constructive arrangement object of the present invention takes place in two directions of space, preferably in two mutually perpendicular directions. In this way it is possible to secure under tension rows of prefabricated modules (3) in different horizontal directions.

[0058] Thus, for prefabricated modules (3) with parallelepiped shape, one can speak of a horizontal securing in the longitudinal direction and a horizontal securing in the transverse direction of the prefabricated module (3).

[0059] Figure 3a shows the securing in either one of said two horizontal directions.

[0060] As shown in Figure 3a, each prefabricated module (3) comprises at least one horizontal conduit (16) in each of the two mutually perpendicular horizontal directions, wherein each horizontal conduit (16) traverses the floor (17) and/or the ceiling and/or a side wall (5) of each prefabricated module (3).

[0061] In some of the prefabricated modules (specifically in the prefabricated modules (3) intended to occupy a first end of each of the horizontal rows of the constructive arrangement), at the end of each horizontal conduit (16) that is not in contact with an adjoining prefabricated module (3), there is a lateral widening or recess (19).

[0062] Likewise, in some of the prefabricated modules (specifically in the prefabricated modules (3) intended to occupy a second end of each of the horizontal rows of the constructive arrangement), at the end of each horizontal conduit (16) that is not in contact with an adjacent

prefabricated module (3), there is a lateral widening or recess (19).

[0063] Alternatively, according to another possible embodiment, all prefabricated modules (3) comprise said lateral recess (19) at both ends of each horizontal conduit (16).

[0064] Like the vertical conduits (4), the horizontal conduits (16) are coated internally with a metal sheath (10) (said sheath can also be made of PVC or other plastic material) along their entire length except in the area of the lateral recess (19). In said area of the lateral recess (19), the horizontal conduits (16) are covered with a metal drawer (11), as is the case with the vertical conduits (4).

[0065] The alignment of horizontal conduits (16) of all the prefabricated modules (3) of a row constitutes a horizontal securing channel (20). As with the vertical securing channels (12), a tendon or securing cable (13) runs longitudinally through each horizontal securing channel (20), and is anchored at the ends of each horizontal securing channel (20) by first and second anchoring elements (14, 15), in a manner similar to that of the anchoring of the securing cable (13) in each vertical securing channel (12).

[0066] By horizontal securing, a monolithic behaviour of each horizontal row of prefabricated modules (3) is achieved.

[0067] The horizontal securing (preferably in two directions) together with the vertical securing of the constructive arrangement, allow to offer a monolithic behaviour of the entire constructive arrangement, thus guaranteeing a level of stability of the constructive arrangement much higher than that observed in other conventional buildings based on prefabricated modules (3).

[0068] Figure 1 shows the vertical securing channels (12) and the horizontal securing channels (20), and the tension forces (with the letter "T") on the securing cables (13).

[0069] The prefabricated modules (3) may comprise at the upper perimeter edge (18) and/or at the lower perimeter edge (18), one or more steps (21). The steps (21) of the upper perimeter edge (18) have a geometry complementary to the steps (21) of the lower perimeter edge (18), so as to facilitate the positioning and stability of prefabricated modules (3) mounted on others.

[0070] Likewise, in said steps (21) a neoprene pad (22) or tape can be fitted, configured to offer a soft contact (that allows relative displacements by vibrations or dilations of the prefabricated modules (3)) between two prefabricated modules (3), located one above the other.

[0071] This neoprene pad (22), together with the geometry of the steps (21), also performs a sealing/waterproofing function to prevent (in the façade modules (3)) rainwater and/or moisture from entering the various horizontal rows of prefabricated modules (3).

[0072] According to a possible embodiment, as shown in Figure 4, the constructive arrangement comprises an auxiliary metal structure (23). This auxiliary metal structure (23) allows securing the false ceiling (not shown), as well as certain installations or conduits that are hidden above the false ceiling (light, water, gas, telephony, etc.). Likewise, this auxiliary metal structure (23) allows the side walls (5) of each prefabricated module (3) to be propped up, giving rigidity to the prefabricated module (3). This functionality of the auxiliary metal structure (23) is especially important in the event that the prefabricated modules (3) lack a ceiling, a situation that could cause the side walls (5) to tilt and/or fracture in the absence of said auxiliary metal structure (23).

Claims

1. A constructive arrangement comprising a first row (1) horizontal of prefabricated modules (3), at ground level, and at least one upper row (2) horizontal of prefabricated modules (3), arranged on a lower row and/or on the first horizontal row (1) of prefabricated modules (3), wherein each row of prefabricated modules (3) comprises at least one prefabricated module (3) located at a first end of the row and a prefabricated module (3) located at a second end of the row, **characterized in that**:

   - within each row, each prefabricated module (3) comprises a floor (17) and/or a ceiling and a plurality of side walls (5, 5'); wherein at least one side wall (5, 5') is in contact with a side wall (5, 5') of another prefabricated module (3) of said row;
   - each prefabricated module (3) of an upper row (2) comprises a lower perimeter edge (18) in contact with an upper perimeter edge (18) of a prefabricated module (3) of a lower row;
   - each prefabricated module (3) comprises at least two vertical conduits (4), wherein each vertical conduit (4) traverses at least one side wall (5, 5') of the prefabricated module (3);
   - the constructive arrangement comprises at least two vertical securing channels (12), wherein each vertical securing channel (12) is formed by an alignment of vertical conduits (4);
   - each prefabricated module (3) comprises at least two horizontal conduits (16), where each horizontal conduit (16) traverses at least one side wall (5, 5'), ceiling or floor (17) of the prefabricated module (3);
   - the constructive arrangement comprises at least two horizontal securing channels (20), wherein each horizontal securing channel (20) is formed by an alignment of horizontal conduits (16);
   - wherein each vertical securing channel (12) is crossed by a securing cable (13) and comprises anchoring elements (14, 15) for the vertical tension securing of a set of prefabricated modules (3), and;

- each horizontal securing channel (20) is traversed by a securing cable (13) and comprises anchoring elements (14, 15) for the horizontal tension securing of a set of prefabricated modules (3).

2. Constructive arrangement according to claim 1, **characterised in that** within each horizontal row, each prefabricated module (3) comprises at least one truncated side wall (5') which in turn comprises an edge which is in contact with an edge of a truncated side wall (5') of an adjacent prefabricated module (3) of said horizontal row.

3. Constructive arrangement according to any of the preceding claims, **characterised in that** each prefabricated module (3) comprises at least one horizontal conduit (16) in a certain direction and another horizontal conduit (16) in another direction, so that the constructive arrangement comprises at least two horizontal channels (20) for securing in two different horizontal directions, where each horizontal securing channel (20) is formed by an alignment of horizontal conduits (16).

4. Constructive arrangement according to claim 3, **characterized in that** the two horizontal directions of the horizontal channels (20) of each prefabricated module (3) are perpendicular to each other.

5. Constructive arrangement according to any of the preceding claims, **characterised in that** each prefabricated module (3) has a parallelepipedic shape.

6. Constructive arrangement according to any of the preceding claims, **characterised in that** each vertical conduit (4) and each horizontal conduit (16) is covered by a metal sheath (10).

7. Constructive arrangement according to any of the preceding claims, **characterised in that** the upper end of each vertical conduit (4) comprises an upper recess (6).

8. Constructive arrangement according to any of the preceding claims, **characterised in that** the lower end of each vertical conduit (4) comprises a lower recess (7).

9. Constructive arrangement according to any of the preceding claims, **characterised in that** it comprises a lower slab (8) located below the first row (1) of prefabricated modules (3), wherein the slab (8) comprises holes (9) at its upper part and recesses (7) at its lower part in correspondence with the holes (9), wherein the holes (9) are configured to coincide with the arrangement of the vertical securing channels (12).

10. Constructive arrangement according to any of the preceding claims, **characterised in that** a first end of each horizontal conduit (16) comprises a lateral recess (19).

11. Constructive arrangement according to any of the preceding claims, **characterised in that** a second end of each horizontal conduit (16) comprises a lateral recess (19).

12. Constructive arrangement according to any one of claims 7 to 11, **characterised in that** each recess (6, 7, 19) is covered with a metal drawer (11).

13. Constructive arrangement according to any of the preceding claims, **characterised in that** the prefabricated modules (3) comprise on an upper edge of their side walls (5, 5') and/or on a lower edge of their side walls (5, 5') one or more steps (21), wherein the steps (21) of the upper edge of the side walls (5, 5') have a geometry complementary to the steps (21) of the lower edge of the side walls (5, 5'), in such a way as to facilitate the positioning and stability of some prefabricated modules (3) mounted on others.

14. Constructive arrangement according to claim 13, **characterized in that** in the steps (21) there is arranged a neoprene pad (22) configured to provide a soft contact between two prefabricated modules (3) located one on top of the other.

15. Constructive arrangement according to any of the preceding claims, **characterised in that** it comprises an auxiliary metal structure (23) configured to prop up the side walls (5, 5') of each prefabricated module (3), as well as configured to support a false ceiling of each prefabricated module (3).

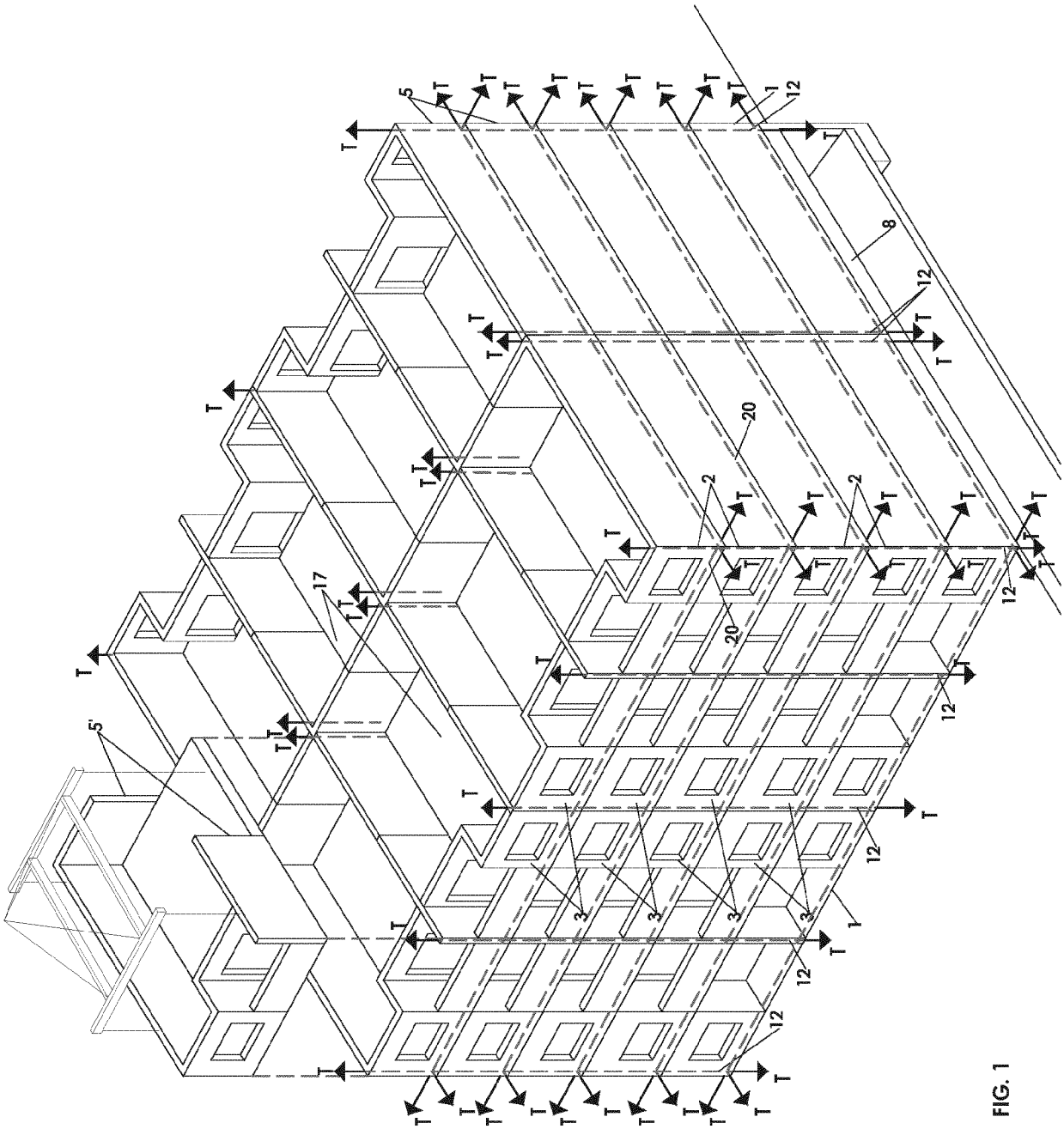

FIG. 1

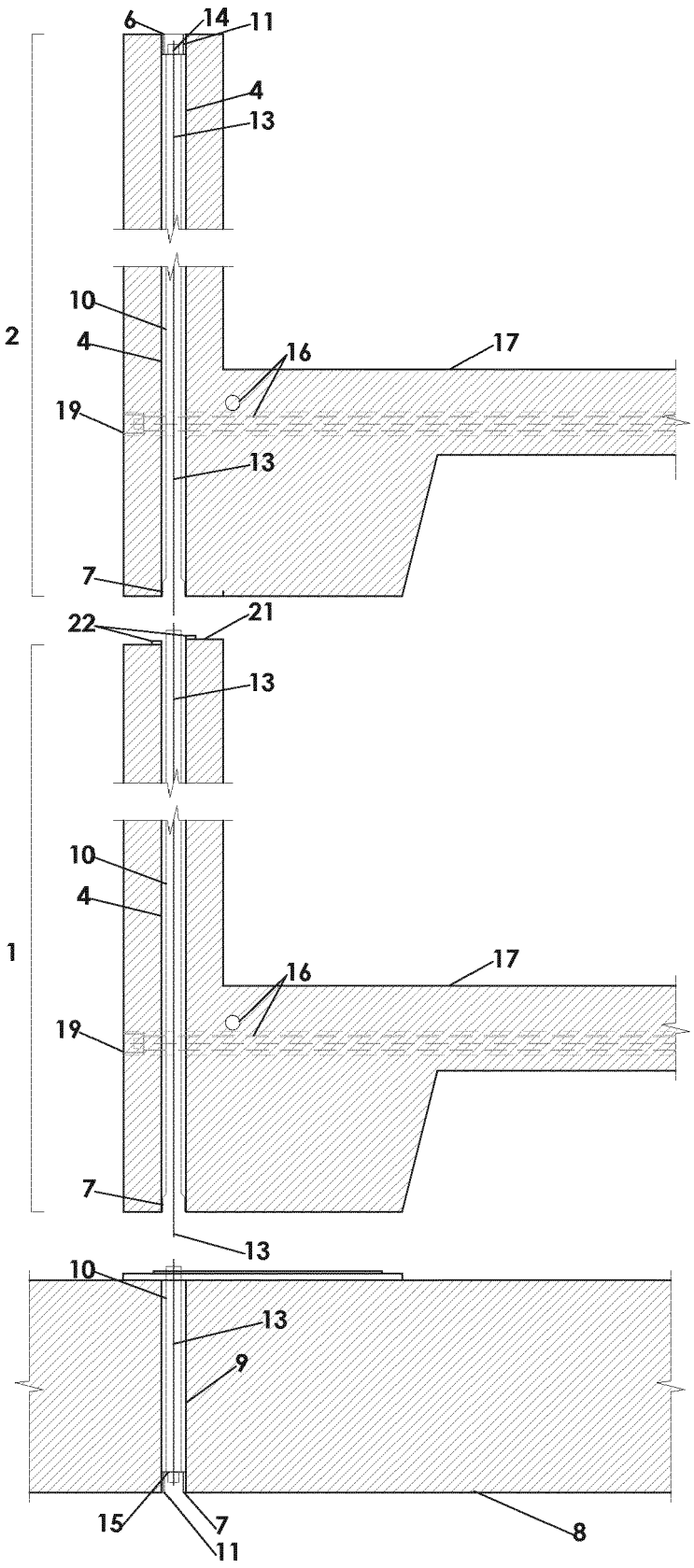
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FIG. 2

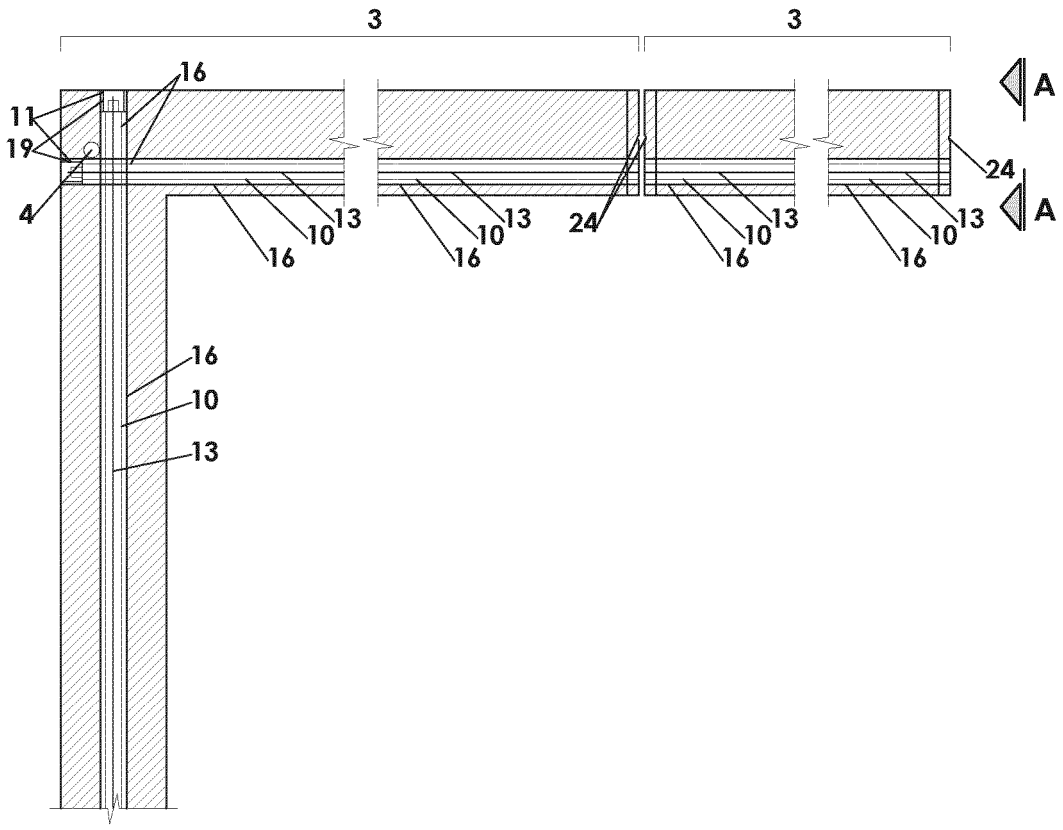

FIG. 3a

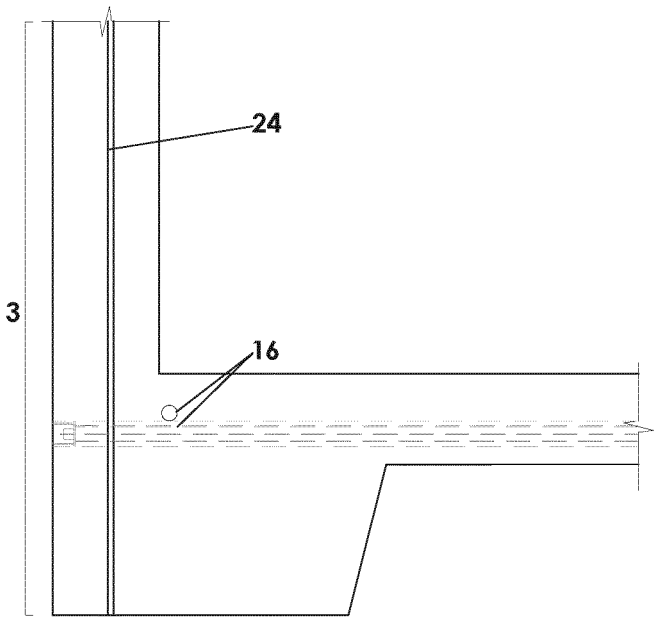

FIG. 3b

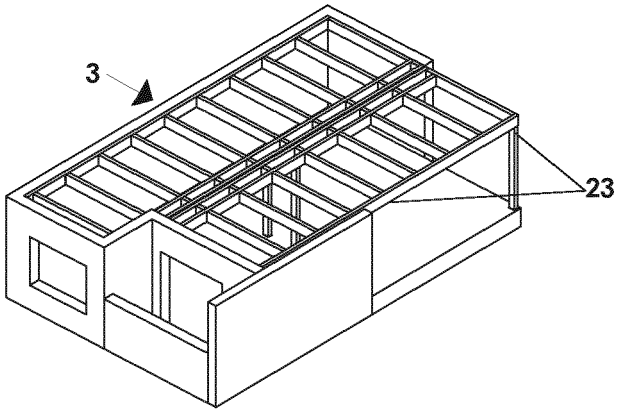

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 21 20 2515

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1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 March 2022	López-García, G

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