



(11)

EP 2 977 522 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
27.01.2016 Bulletin 2016/04

(51) Int Cl.:
E04F 11/18 ^(2006.01) **E04B 1/24** ^(2006.01)
E04H 9/02 ^(2006.01)

(21) Application number: **15177781.0**

(22) Date of filing: **21.07.2015**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME
Designated Validation States:
MA

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(30) Priority: **21.07.2014 IT BO20140415**

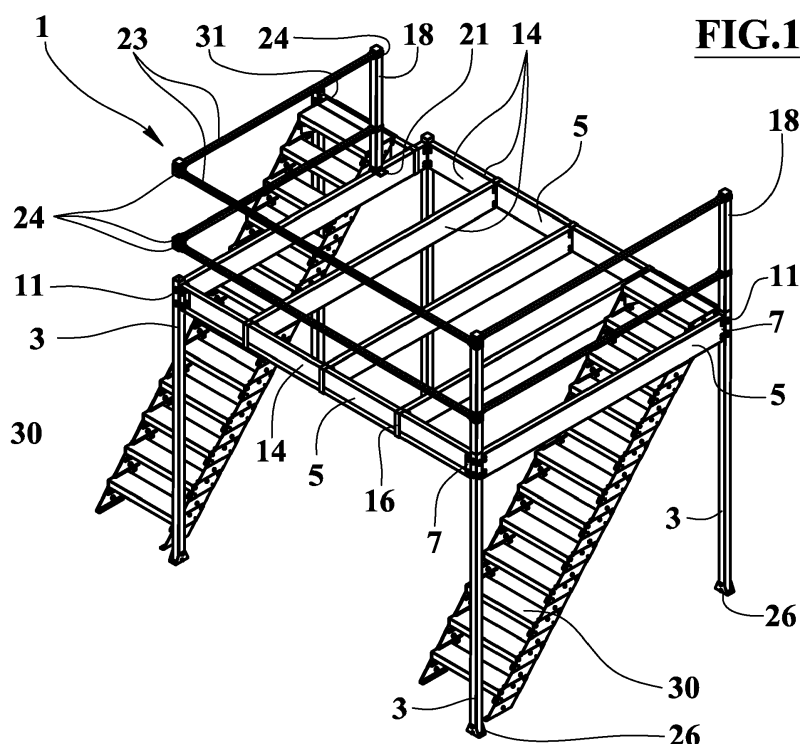
(54) **ASEISMIC LOFT**

(57) An aseismic loft comprises at least a plurality of upright (3), of elongated tubular shape with flat longitudinal faces, and a plurality of beam (5) assigned, in an assembled condition of the loft, to be respectively vertical and horizontal and to be mutually connected.

The upper end of each upright (3) has two first con-

nection means (7) each with "U" square shaped cross section and whose median face (8) is fixed to a corresponding face of upright (3).

At least one of the lateral faces (9) of the first connection means (7) is fixed to one end of one of the beam (5).



Description

[0001] The present invention relates to the field concerning the structures for houses and refers to an aseismic loft to be installed in homes and in close environments in general to increase the useful surface and it being able to independently resist to seismic events also of high intensity.

[0002] There are known loft structures built primarily with screw or junction interconnections of the type used in shelving.

[0003] A drawback of such known structures consists in that, despite being self-supporting, do not provide any resistance to seismic events.

[0004] Another drawback of these known structures is that often require side fixing to walls of the installation premises modifying, often in an unpredictable way, the characteristics thereof.

[0005] One object of the present invention is to propose an aseismic loft easily installable and withstanding to aseismic events also of high degree.

[0006] Other object is to propose a loft that does not require fasteners to the walls of the installation room.

[0007] A further object is to propose a modular loft.

[0008] The characteristics of the invention are highlighted in the following with particular reference to the accompanying drawings in which:

- Figures 1-3 show respectively axonometric and side views, of an embodiment of the aseismic loft object of the present invention where in Figure 1, certain portions have been removed to better highlight others;
- Figures 4-7 show axonometric views, respectively from two different sides and from above of a further embodiment of the aseismic loft object of the present invention;
- Figures 8-10 show axonometric views of a connection main junction between uprights and beams of the lofts of the preceding figures;
- Figures 11-14 show axonometric views of junctions, connections and supports of lofts of Figures 1-7;
- Figures 15-17 show axonometric and orthogonal projection views of a channel beam of the lofts of Figures 1-7;
- Figures 18-21 illustrate axonometric and orthogonal projection views of a bracket means of the loft of Figures 1-7;
- Figures 22-24 illustrate axonometric and orthogonal projection views of an annular connection means of the lofts of Figures 1-7;
- Figures 25-27 illustrate axonometric views and orthogonal projection of a stanchion means of the lofts of Figures 1-7;
- Figures 28-31 illustrate axonometric and orthogonal projection views of a "C" connection means of the main junction of Figures 8-10;
- Figures 32-34 show axonometric and orthogonal

projection views of an upright of the lofts of Figures 1-7 associated with "C" connection means of Figures 28-31;

- Figures 35-38 show axonometric and orthogonal projection views of a foot means of figure 14.

[0009] With reference to Figures 1-14, 1 indicates the loft, object of the present invention, comprising at least four upright means 3, each consisting of a profile made of steel or other suitable material of elongated tubular shape with flat longitudinal faces, and comprising at least four beam means 5 assigned, in an assembled condition of the loft, to be respectively vertical and horizontal; in said condition the upper ends of the upright means 3 are connected to the respective ends of the beam means 5 in correspondence of the main junctions of the loft.

[0010] The upper end of each upright means 3 carries at least two first connection means 7, for example made of punched, perforated, and folded steel sheet, each with transversal squared "U" shaped section and whose median face 8 is fixed to a corresponding face of the upright means 3. As shown in Figure 1, at least one of the side faces 9 of each first connection means 7 is fixed to one end of one of the beam means 5. Preferably both side faces 9 of a first connection means 7 are fixed to two vertical side faces of the beam means 5 shaped in a tubular single body or preferably made by two longitudinal elements, as better described hereinafter.

[0011] The median face 8 and the side faces 9 of each first connection means 7 bear the holes for locking means 11 engaged in corresponding holes of the ends of the upright means 3 and of the beam means 5. The holes of each first connection means 7 or preferably the inner ends of these holes are provided with nut screw means 12, by way of example constituted by threaded screws welded or fastened to the edges of the holes, and the locking means 11 consist of corresponding screws.

[0012] Each beam means 5 comprises a "C" channel 14, for example, made of bent sheet or of square extruded metal profile, or preferably of two of such coupled and mutually facing channels 14 and arranged to form a beam means 5 with rectangular section. Preferably each channel 14 has a longitudinal median vertical face of greater width than the width of the two longitudinal horizontal side faces which are equal to each other.

[0013] The loft comprises a set of parallel joists, each made by a channel 14 or by a pair of profiles coupled as in the beam means. The ends of each joist are fixed to two opposite beam means 5 by means of respective connectors 16.

[0014] Each connector 16, for example made of punched, perforated and folded steel sheet, has a split annular portion assigned to be engaged around a beam means 5 embracing it. Each end of the split annular connector 16, has an orthogonal flange having holes for screw means engaged in the terminal holes of the corresponding channel 14 locking it to the beam means 5.

[0015] The loft comprises a plurality of stanchion

means 18, i.e. vertical, tubular, square section or rectangular fence elements, equal to the upright means 3.

[0016] The stanchion means 18 are coaxially fixed to the upright means 3 and/or vertically fixed to the beam means 5 respectively through spigot connection means 19 and/or by support means 21 that can be fixed to a respective beam means 5.

[0017] The spigot connection means 19 consist of four corner pieces 20 fixed to the inner corners of the stanchion means 18 and projecting downwards from them to engage the upper inner end of the respective upright means 3.

[0018] Each of the support means 21 comprises a "C" connection which can be fixed to a respective beam means 5 and whose upper part is provided with a cup means 22 for housing the lower end of the respective stanchion means 18 or the spigot connection means 19 of such stanchion means 18.

[0019] The loft also comprises a plurality of handrail means 23 consisting of straight tubular elements with a rectangular or square section. The ends of each handrail means 23 have respective transversal holes and are fixed to two stanchion means 18 by respective open ring attachments 24 each engaged in one of the stanchion means and the ends of which bear holes engaged by screw means also engaged in the transversal holes of a corresponding end of the handrail means 23. The set of the stanchion means 18 and of the handrail means 23 forms a perimeter fence or parapet, which guarantees the safety of users of the aseismic loft.

[0020] The lower end of each upright means 3 carries holes for screw means for the fixing of a respective foot means 26, for example made of cut, drilled and folded steel sheet, having a horizontal rectangular lower face resting on the ground having two lateral vertical flange bearing the holes for said fixing screw means. The lower faces of such foot means 26 are arranged with holes to be fixed to the ground by means of expansion screws, chemical dowels or similar.

[0021] The loft also comprises a floor, made of slabs or boards of wood, its derivatives or substitutes, made of metal or other materials. Such floor is supported by the joists each made by a channel 14.

[0022] For the access to the loft, it can be equipped with at least one stair 30 whose upper end is fixed to a beam means 5 or to a console means 31 having one end overhang fixed to a beam means 5 and the other end fixed to an additional respective upright means 3. The console means 31 can be constituted by a segment of the beam means 5 fixed to one of the perimeter beam means 5 by a connector 16.

[0023] The operability of the aseismic loft provides that it is installed in place, for example in a domestic, commercial, industrial or otherwise premise, without the need for masonry work and without the need of connections or fixings to the walls or to the structures of the installation premise. This assembly requires simple manual tools available to anyone and does not require special skill or

training.

[0024] An advantage of the present invention is to provide an aseismic loft easily installed and able to withstand to aseismic events also of high degree.

[0025] Other advantage is to provide a loft that does not require fixing to the walls of the installation premise.

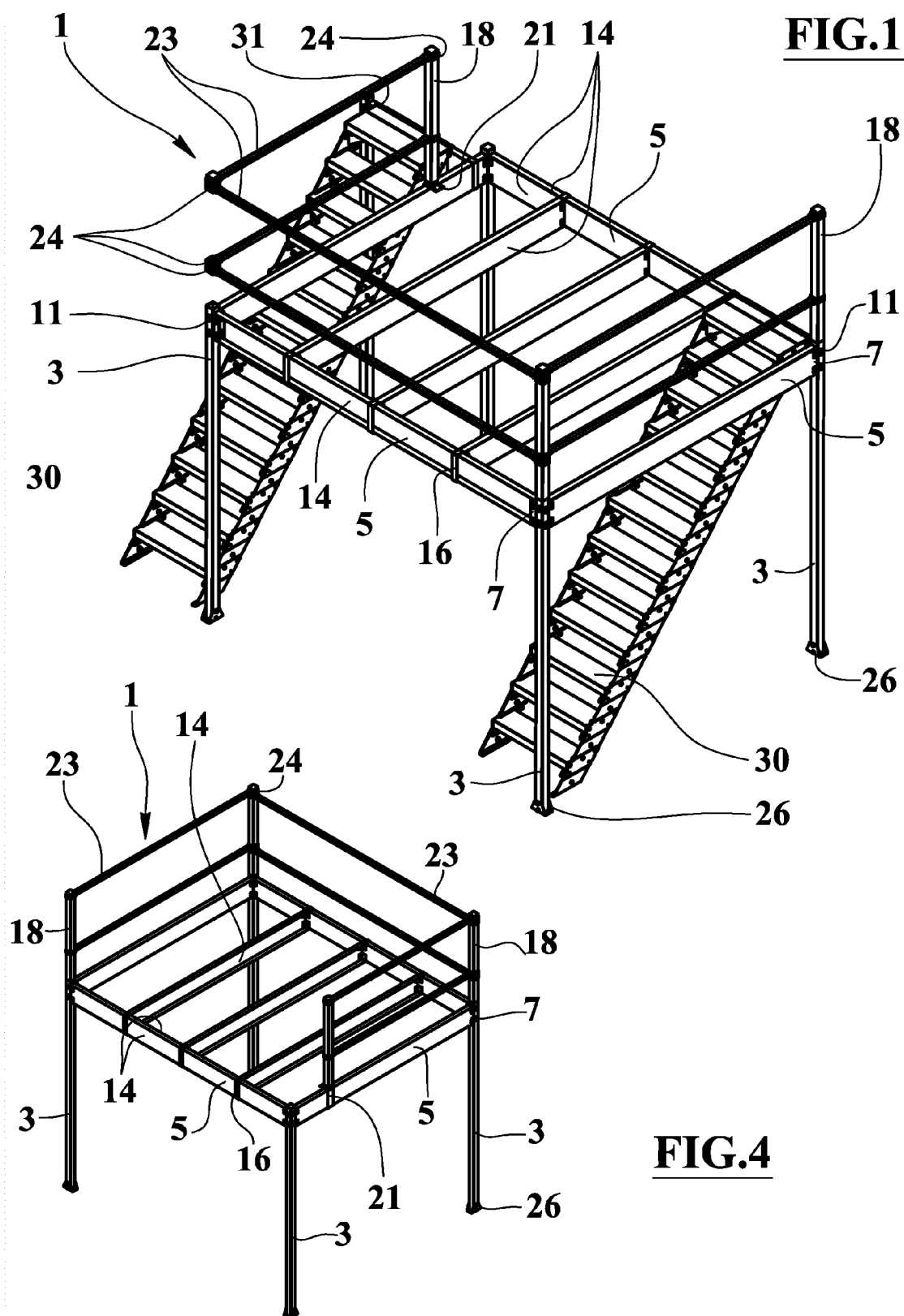
[0026] Further advantage is to provide a modular loft.

10 Claims

1. Aseismic loft comprising at least a plurality of upright (3), of elongated tubular shape with flat longitudinal faces, and a plurality of beam (5) assigned, in an assembled condition of the loft, to be respectively vertical and horizontal and to be mutually connected; said loft being **characterized in that** the upper end of each upright (3) has two first connection means (7) each with "U" square shaped cross section and whose median face (8) is fixed to a corresponding face of upright (3) where at least one of the lateral faces (9) of the first connection means (7) is fixed to one end of one of the beam (5).
2. Loft according to claim 1 **characterized in that** the median face (8) and the lateral faces (9) of each first connection means (7) has holes for locking means (11) engaged in corresponding holes of the upright (3) ends and beam (5).
3. Loft according to claim 2 **characterized in that** the holes of each first connection means (7) or the inner ends of these holes are provided with nut screw means (12) and that the locking means (11) consist of corresponding screws.
4. Loft according to any one of the previous claims **characterized in that** each beam (5) comprises a "C" squared channel (14) or two of such channel (14) coupled facing and arranged to form a beam (5) with rectangular cross section preferably where each channel (14) has a median vertical longitudinal face of a width greater than the width of the two lateral longitudinal horizontal faces that are equal.
5. Loft according to claim 4 **characterized in that** it comprises a set of joists each consisting of at least one channel (14) and having its ends fixed to two opposed beam (5) by means of respective connectors (16) each having a split annular portion assigned to twine round a beam (5) and having at each end a flange having holes for screw means engaged in the end holes of the corresponding terminal channel (14) or pair of channel (14), locking them.
6. Loft according to any one of the previous claims **characterized in that** it comprises a plurality of tubular stanchion means (18) whose sections are rec-

tangular or square and equal to the upright (3) section; said stanchion means (18) are fixed vertically to the upright (3) and/or to the beam (5), respectively through spigot connection means (19) each consisting of four corner pieces (20) fixed to the inner corners of the stanchion means (18) and protruding from the latter (18) and assigned to engage the upper inner end of the respective upright (3) or via support means (21) each comprising a "C" connection fixable to a respective beam (5) and whose upper portion is equipped with a cup means (22) for housing the lower end of the respective stanchion means (18) or the spigot connection means (19) of the stanchion means (18).

7. Loft according to claim 6 **characterized in that** it comprises a plurality of handrail means (23), consisting of tubular elements with a rectangular or square section; the ends of each handrail means (23) have respective transverse holes and are fixed to two stanchion means (18) via respective open ring attachments (24) each engaged in one of the stanchion means and the ends of which bear holes engaged by screw means engaged also in the transverse holes of a corresponding end of the handrail means (23).
8. Loft according to any of the previous claims **characterized in that** the lower end of each upright (3) has holes for screw means for fixing a respective foot means (26) having a rectangular and horizontal lower face resting on the ground having holes for fixing it to the ground and two vertical lateral wings having holes for said fastening screw means.
9. Loft according to claim 5 **characterized in that** it comprises a floor, in sheets or boards, supported by joists each consisting of a channel (14).
10. Loft according to any one of the previous claims **characterized in that** it comprises at least one stair (30) whose upper end is fixed to a beam (5) or to a projecting console means (31) having one end fixed to a beam (5) and the other end secured to a respective additional upright (3).



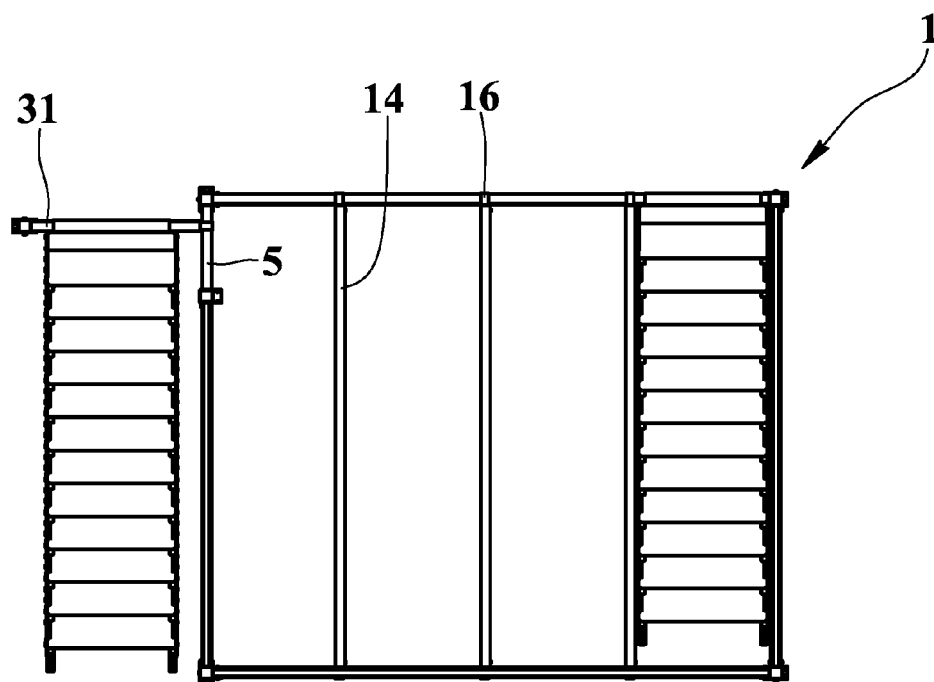
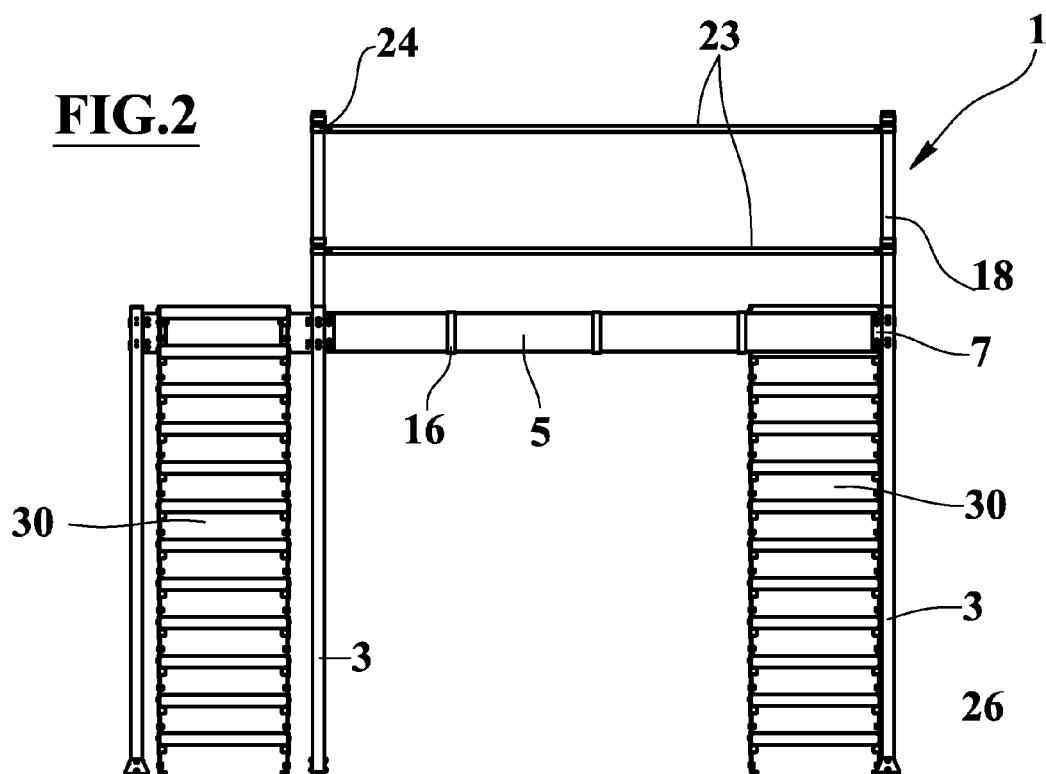


FIG.3

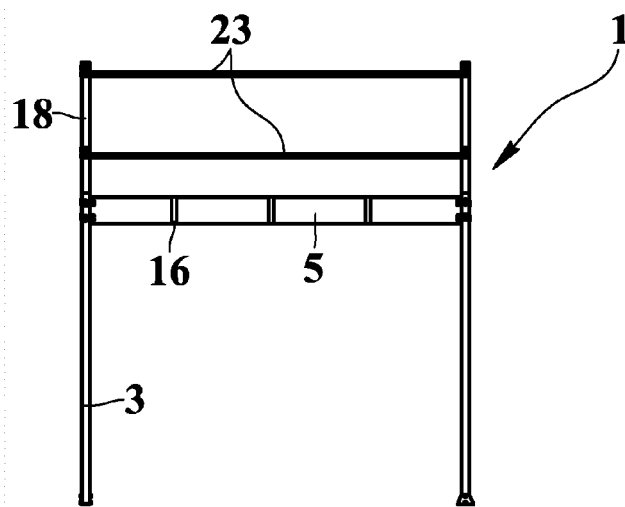


FIG. 5

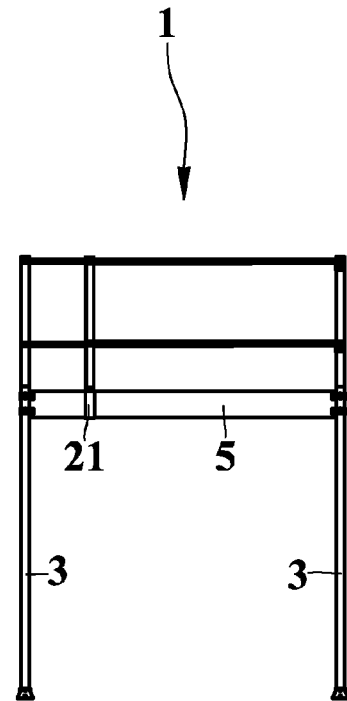


FIG. 6

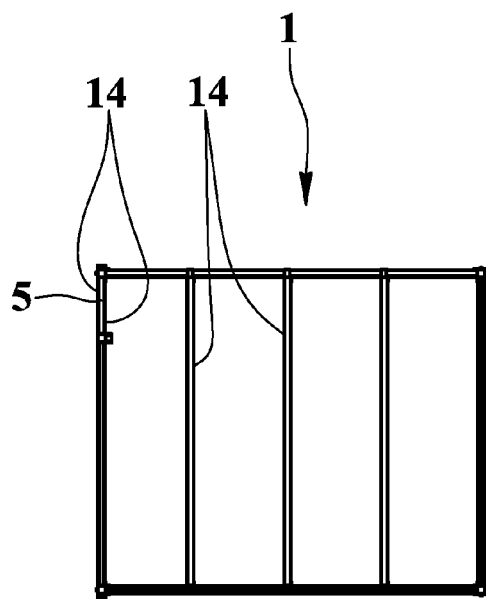


FIG. 7

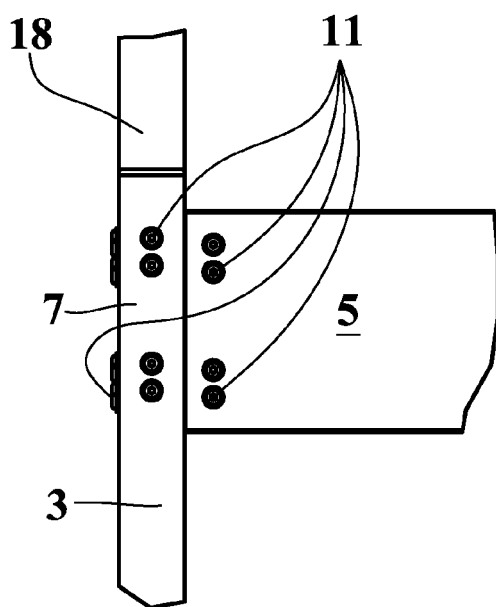


FIG. 8

FIG. 9

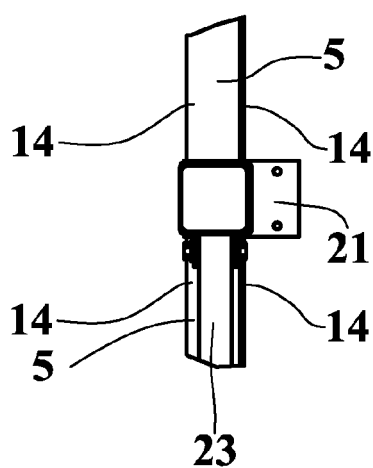
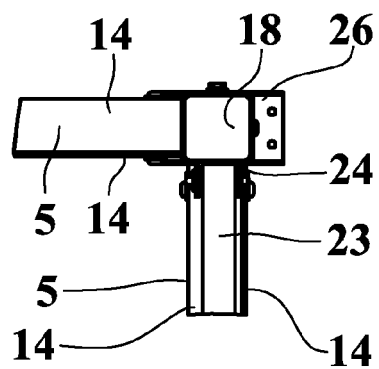


FIG. 10

FIG.11

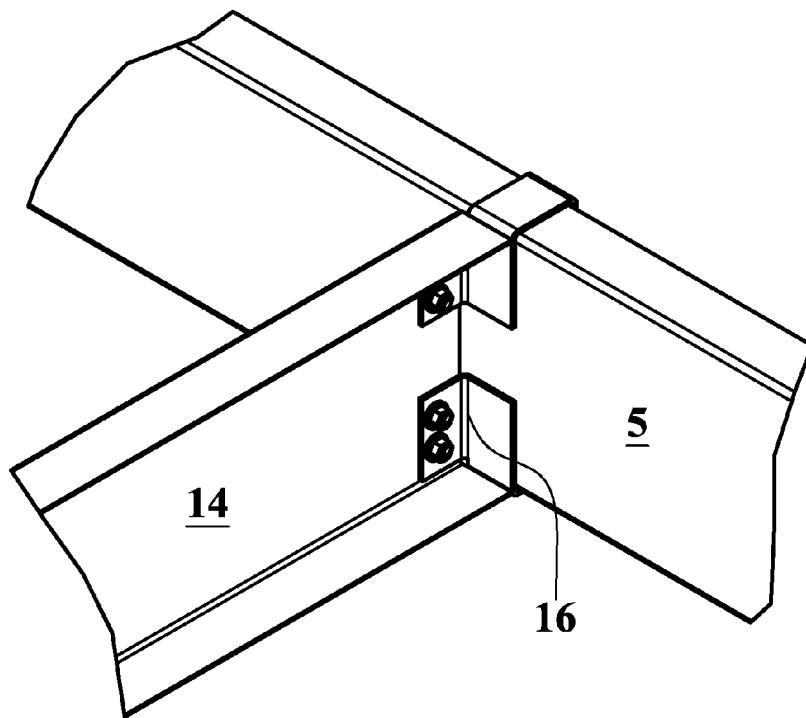


FIG.12

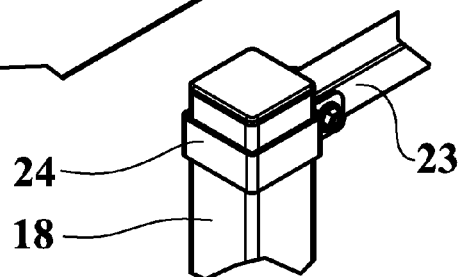
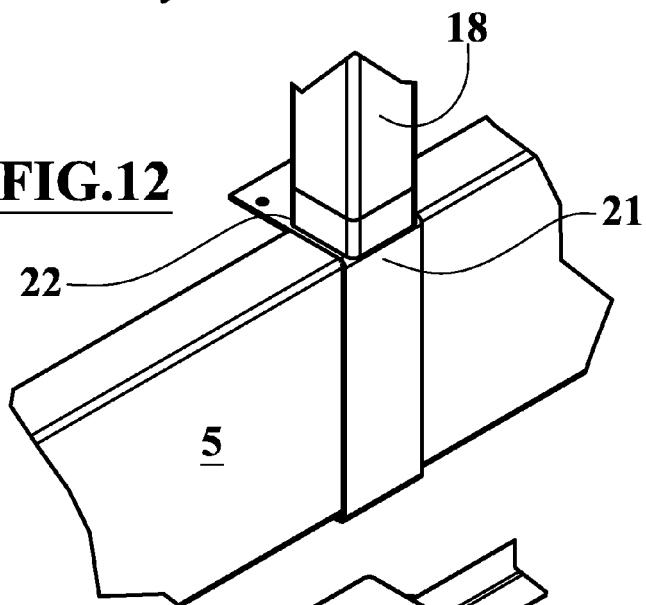


FIG.13

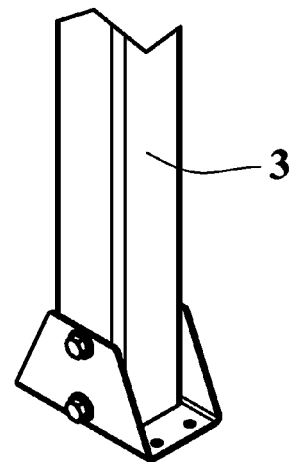


FIG.14

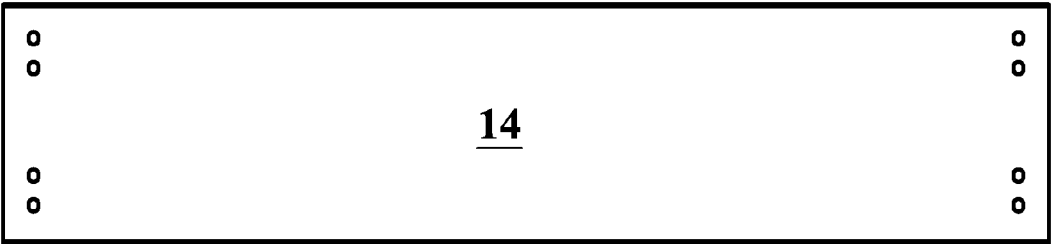
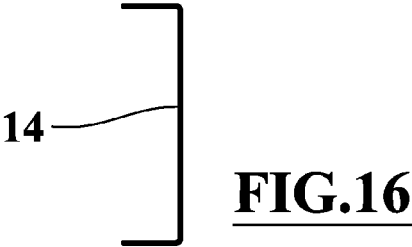
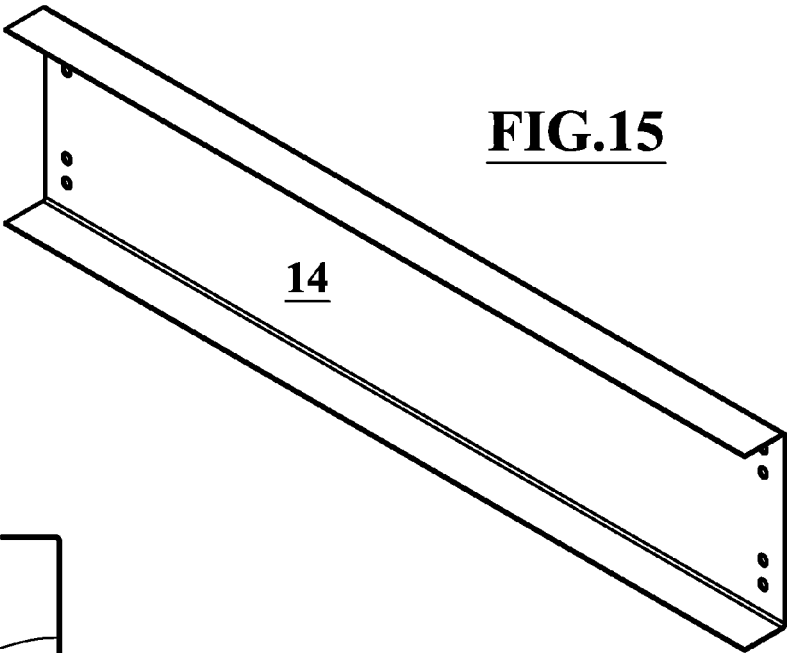


FIG.17

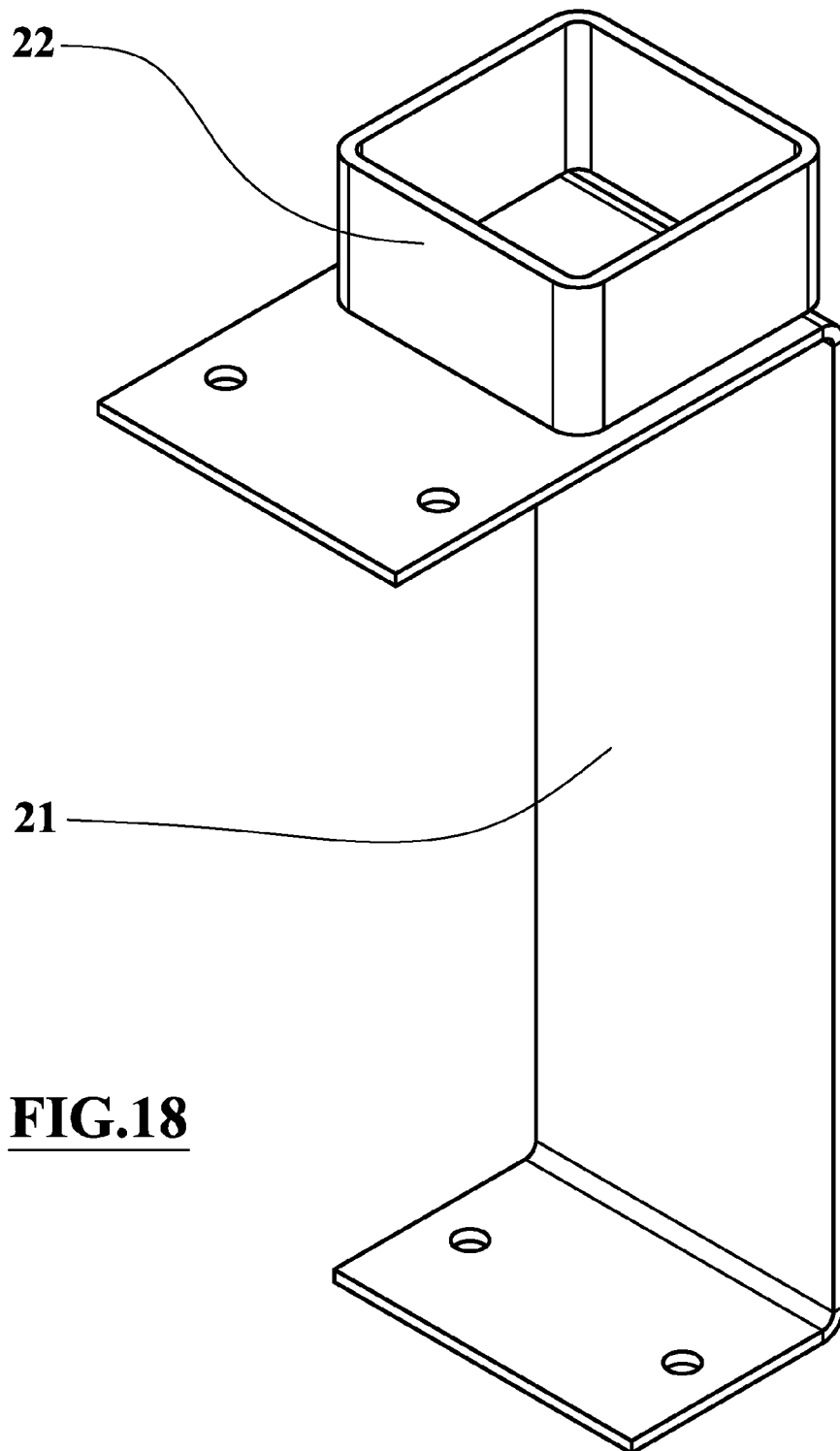


FIG.18

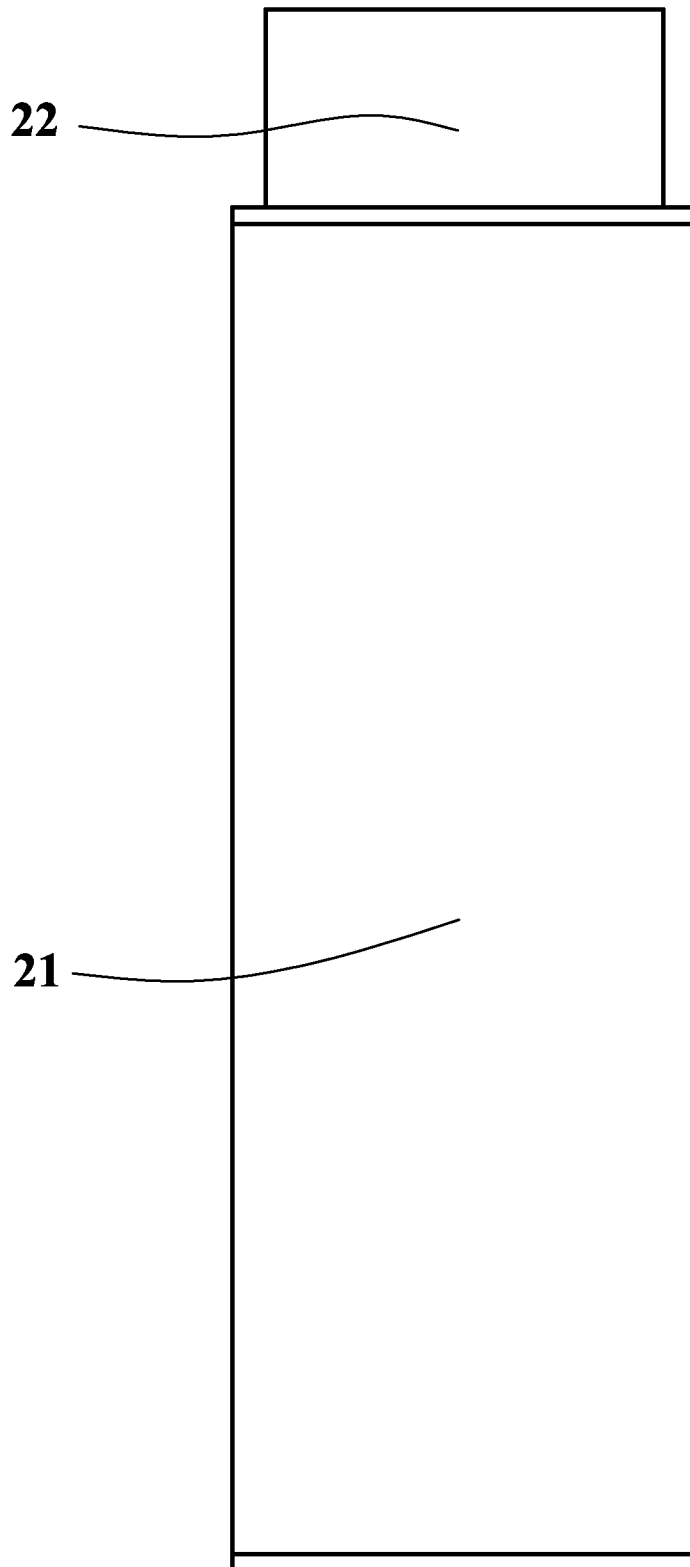


FIG.19

FIG.20

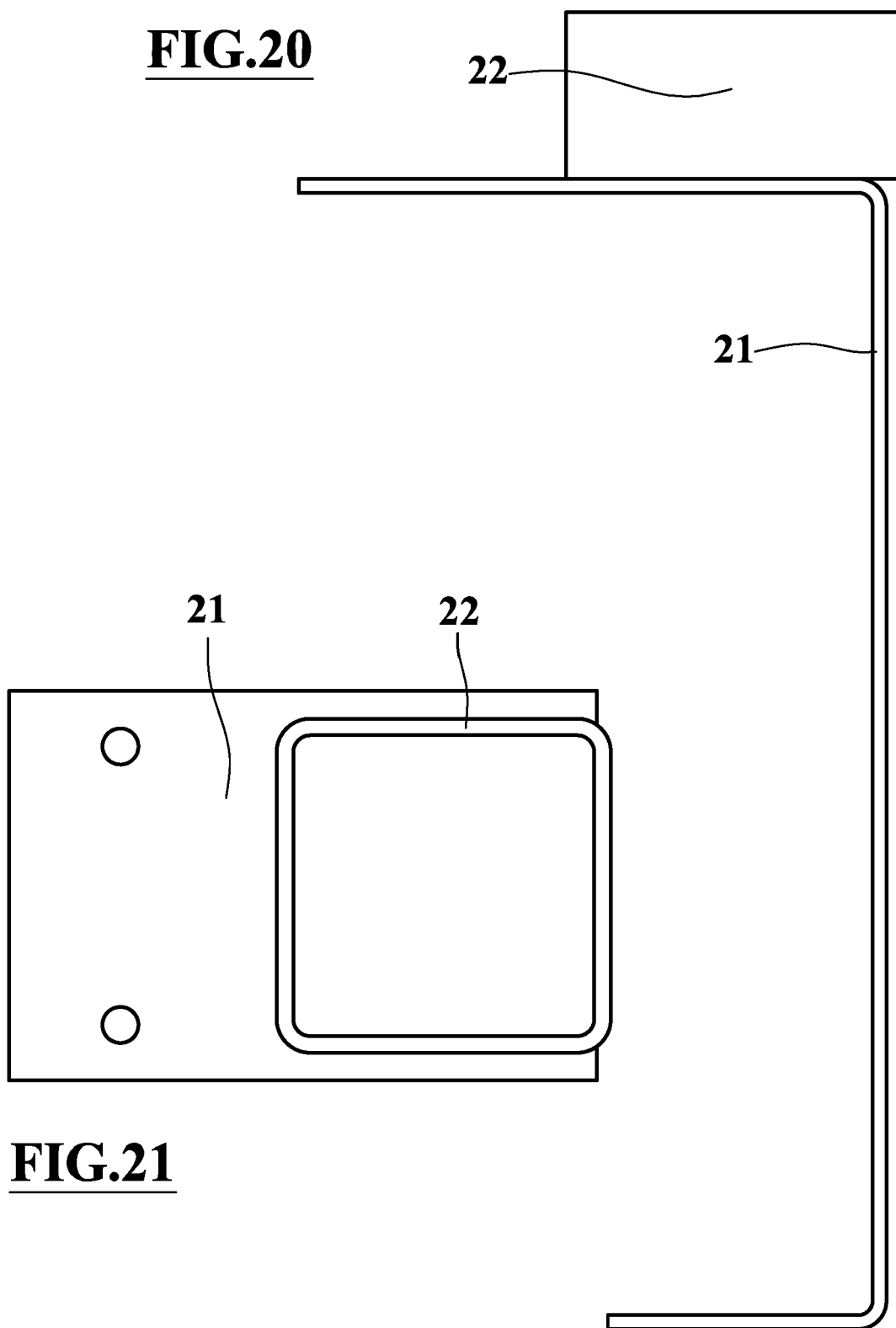


FIG.21

FIG.22

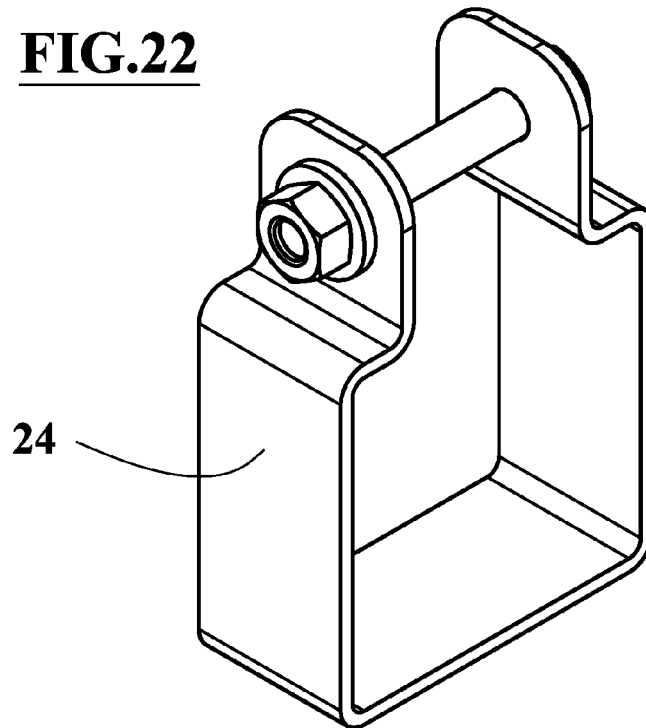


FIG.24

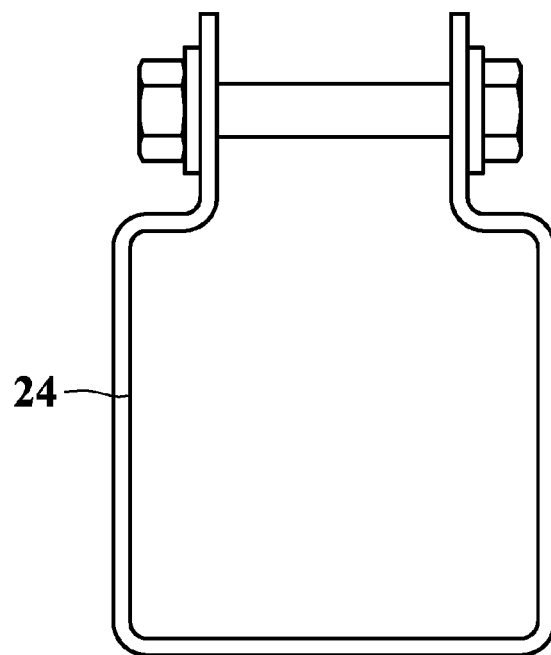
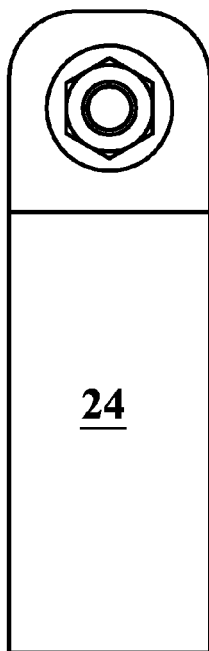


FIG.23



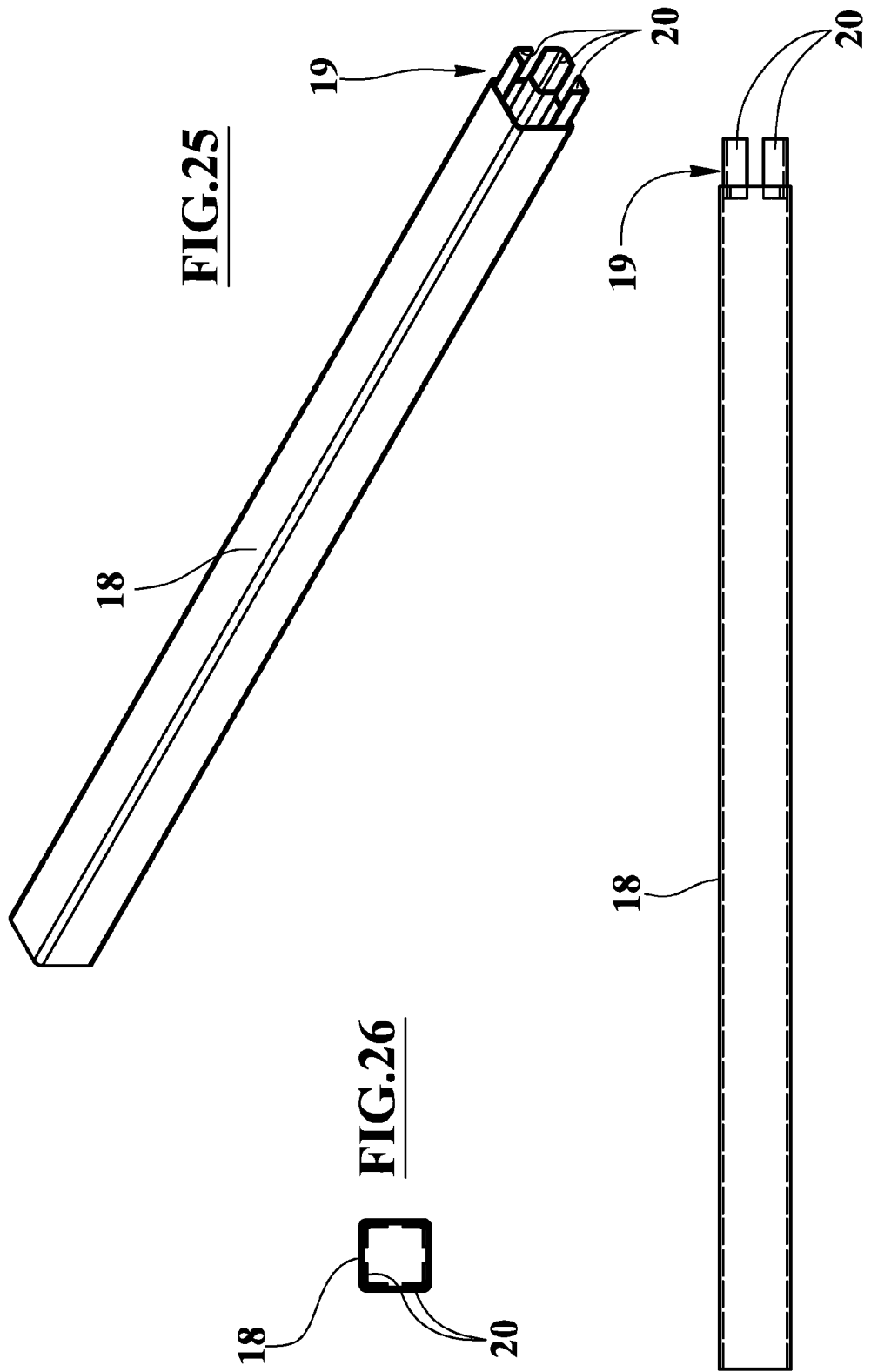


FIG.28

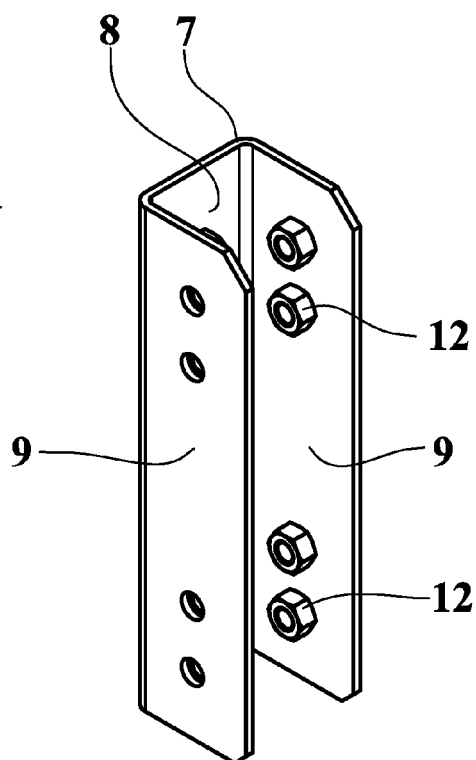


FIG.29

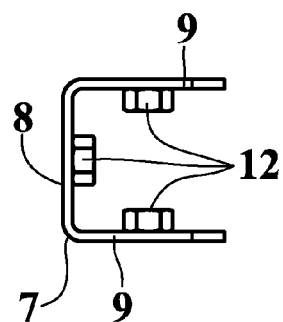


FIG.30

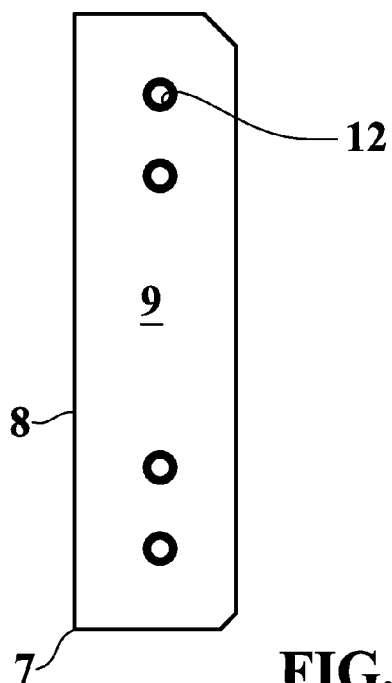
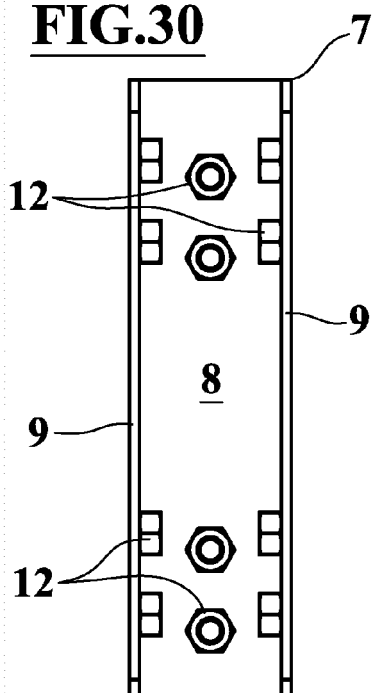


FIG.31

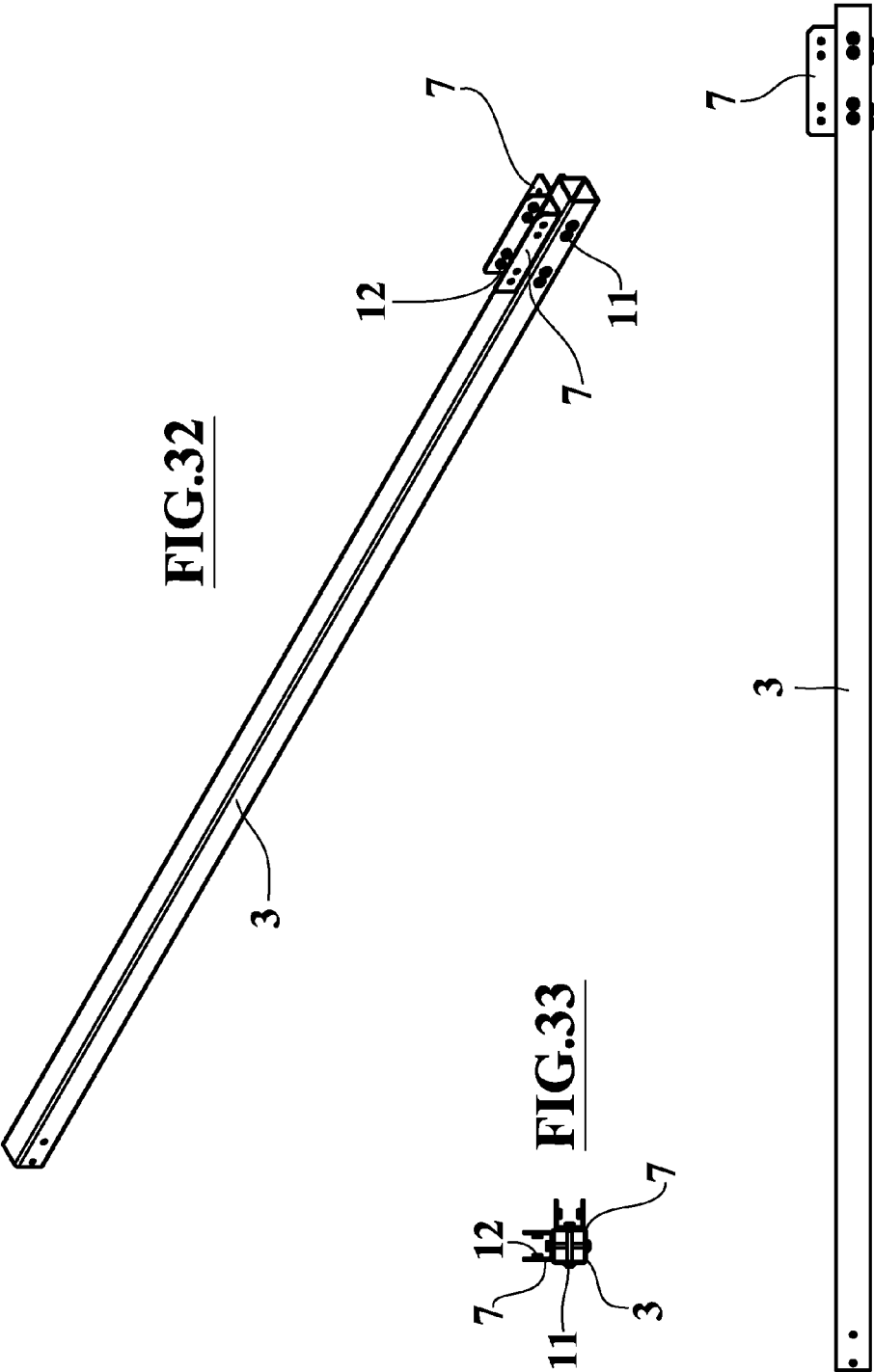


FIG.32

FIG.33

FIG.34

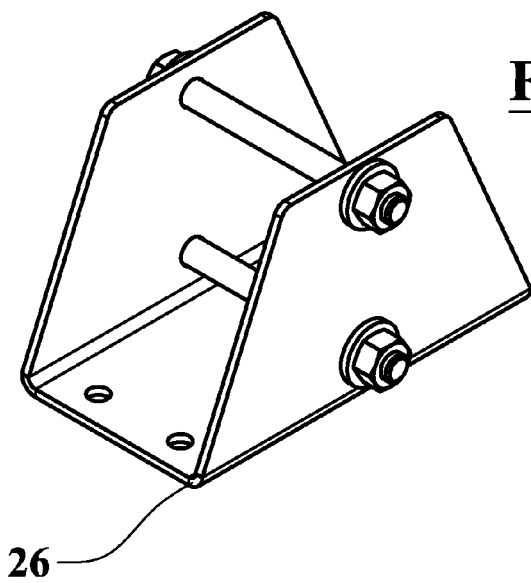


FIG.35

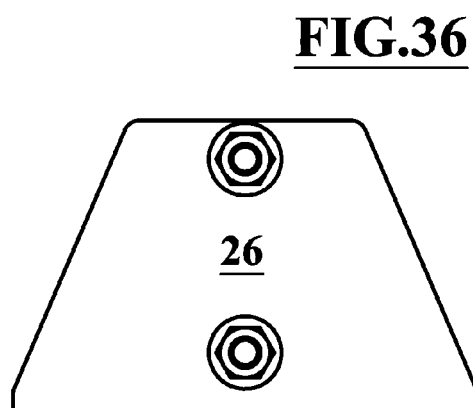


FIG.36

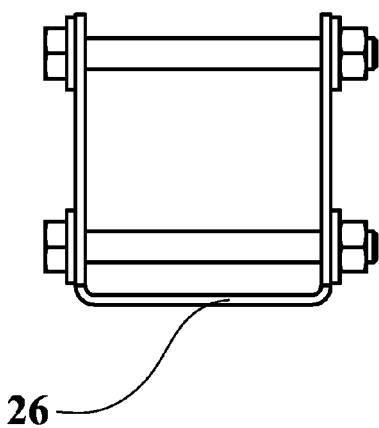


FIG.37

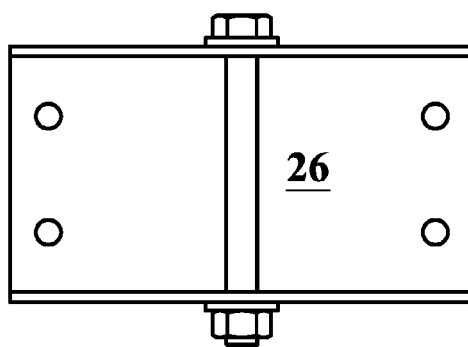


FIG.38