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US 4693449 A
KR 10-1691525 B1

2019100147 13 Feb 2019

Abstract

The invention discloses a fast moving installation supporting system, which comprises a number of movable support devices, and each movable support device comprises a support device, a movable device, a support anchor device and an angle bracket device. The movable device can dismantle and install at the bottom of the support device; the support anchor device and the angle bracket device can be respectively dismantled and installed on the top of the support device. The support device includes a supporting structure, a connecting bracket, at least one working platform, at least one skirting board, an aluminum I-shaped board and a mounting flat plate; the support anchor device includes a rotary adjustable device, a base, a channel, a bracing strut and a brace. The fast moving installation supporting system of the invention is equipped with the height-adjustable support anchor device, which can be retractable by whirling the rotary adjustable device of the support anchor device, so that the invention can be suitable to the different floor heights and provide support of different heights. The invention is also equipped with the movable device, which enables the invention to perform rapid moving and increase the progress of construction.

2019100147 25 Feb 2019

Fast Moving Installation Supporting System

Technical Field

The present invention relates to the technical field, specifically, which relating to a fast moving installation supporting system.

Technical Background

Construction formwork, a type of supporting tools which is commonly used for building molding, are mainly used for providing temporary support. They need to be made by building formwork of corresponding shapes according to the building structure, shape and dimensions.

Moreover, traditional building formwork used timber molding formwork made up by wooden panels and patterns at the same time. Floor between floors are generally supported by a number of wooden columns which nailed to the panel become the supporting slab in order to support the floor slab formwork. Although wooden panel supports are simple in structure, however, nailing and shape cutting need to be conducted manually, the whole process is time-consuming and laboursome. Moreover, as the distance between floors is inconsistent for different buildings, wooden panel supports for the same floor cannot be reused, which results in high construction costs and waste of resources. Therefore, in current technology, traditional wooden panel supports are commonly replaced with recyclable building gantries for support.

However, existing building gantries are made according to building requirements, and thus cannot be moved after installation. After the task of supporting a floor slab formwork has been finished, building gantries can only be moved to a next floor to be supported by repeated dismantling and installation. Moreover, due to the rigidity requirement of support and the need for a certain load, building gantries have a large overall weight. As such, for operating worker, the operation process is less flexible, such that the construction efficiency is low, and safety issues are prone to arise.

Summary of the Invention

In view of the drawbacks of current technology, the present invention provides a fast moving installation supporting system that is movable and has strong applicability.

The present invention open the fast moving installation supporting system which comprises a number of movable support devices, and each movable support device comprises a support device, a movable device, a support anchor device and an angle bracket device, wherein the movable device can dismantle and install at the bottom of the support device; the support anchor device and the angle bracket device can be respectively dismantled and installed on the top of the support

device; the support device comprises a supporting structure, a connecting bracket, at least one working platform, at least one skirting board, an aluminum I-shaped board and a mounting flat plate; wherein the connecting bracket is equipped with the supporting structure; at least one working platform is installed on the connecting bracket; at least one skirting board is installed on at least one working platform and located on one side of the supporting structure, and the aluminum I-shaped board is equipped on the top of the supporting structure; the mounting flat plate is installed above the aluminum I-shaped board; the movable device is installed at the bottom of the supporting structure; the angle bracket device is installed on the mounting flat plate; the support anchor device comprises a rotary adjustable device, a base, a channel, a bracing strut and a brace, wherein the rotary adjustable device comprises a rotary unit; a middle portion of the rotary unit is equipped with a rotary hole; the rotary hole passes through the rotary unit; an inner wall of the rotary hole is equipped with an internal thread; the rotary unit is equipped on the top of the base; the bottom of the base is equipped with the channel; the channel is equipped with at least one bracing hole; the bracing strut is equipped with an external thread mated with the internal thread; one side of the bracing strut penetrates through the rotary unit, the base, the bracing hole and the mounting flat plate, and the other side is connected with the brace.

According to the implementation of the present invention, the rotary unit also comprises a clamping annular groove, wherein the clamping annular groove is equipped with one side of the rotary unit and arranged annularly around the rotary hole; the rotary unit is equipped on the top of the base through the clamping annular groove.

According to the implementation of the present invention, the rotary adjustable device also comprises at least one rotary handle, wherein at least one rotary handle is fixed on an outer wall of the rotary unit.

According to the implementation of the present invention, the base comprises a circular through-pipe, a base bottom board and two base side boards; wherein the circular through-pipe penetrates through the base bottom board and the bracing hole; the two base side boards are connected perpendicularly to the base bottom board; the bottom surface of the base bottom board cooperates with inner side surfaces of the two base side boards to form a base bracing groove; the bracing strut penetrates through the circular through-pipe.

According to the implementation of the present invention, the base also comprises at least one first reinforcing board, wherein the first reinforcing board is connected respectively with the circular through-pipe and the base side boards.

According to the implementation of the present invention, the brace comprises a bracing bottom board and two bracing side boards which are connected vertically with the bracing bottom board, wherein a top surface of the bracing bottom board cooperates with inner side surfaces of

2019100147 25 Feb 2019

the two bracing side boards to form a supporting bracing groove; one side of the bracing strut is connected to the bottom surface of the bracing bottom board.

According to the implementation of the present invention, the brace also comprises at least one second reinforcing board, wherein the second reinforcing board is connected respectively with the bracing bottom board and the bracing strut.

According to the implementation of the present invention, the bracing side boards are each equipped with at least one reinforcing threaded hole.

The beneficial effects that distinguish the present invention from current technology are as follows: the fast moving installation supporting system of the invention is equipped with a height-adjustable support anchor device, which can be retractable in height by whirling the rotary adjustable device of the support anchor device, so that the invention can be suitable to the different floor heights and provide support of different heights. Meanwhile, the invention is equipped with a movable device, which enables the invention to perform rapid moving to a to-be-constructed area and increase the progress of construction.

Brief Description of the Figures

The brief description of the figures are used for providing a further understanding of the present application, which constitute part of the present application. The implementation of the present application and illustration are used for explaining the present application, and do not constitute improper limitations. In the figures:

Figure 1 is a structural schematic diagram of a movable support device in accordance with the implementation;

Figure 2 is a top view of a mounting flat plate in accordance with the implementation;

Figure 3 is a main view of a support anchor device in accordance with the implementation;

Figure 4 is a side view of the support anchor device in accordance with the implementation;

Figure 5 is a top view of a rotary adjustable device in accordance with the implementation;

Figure 6 is a structural schematic diagram of a channel in accordance with the implementation;

Figure 7 is a side view of an angle bracket device in accordance with the implementation;

Figure 8 illustrates a first reference diagram for the use of a fast moving installation supporting system in accordance with the implementation;

Figure 9 is a top view of a movable support device in Figure 8;

Figure 10 illustrates a second reference diagram for the use of the fast moving installation supporting system in accordance with the implementation;

Figure 11 is a structural schematic diagram of a supporting structure in accordance with the

2019100147 25 Feb 2019

implementation;

Figure 12 is a structural schematic diagram of an outer aluminum top supporter in accordance with the implementation;

Figure 13 is a structural schematic diagram of an inner aluminum top supporter in accordance with the implementation; and

Figure 14 is a main view of a support anchor device in accordance with the implementation.

Reference numerals are illustrated as follows: 10-movable support device; 20-molding formwork; 30-support beam; 11-support device; 12-movable device; 13-support anchor device; 14-angle bracket device; 111-supporting structure; 112-connecting bracket; 113-working platform; 114-skirting board; 115-aluminum I-shaped board; 116-mounting flat plate; 1161-mounting threaded hole; 131-rotary adjustable device; 132-base; 133-channel; 134-bracing strut; 135-brace; 1311-rotary unit; 13111-rotary hole; 1331-bracing hole; 141-angle bracket; 1411-angle bracket fixing threaded hole; 142-angle bracket reinforcing device; 1421-corner iron; 1422-pin; 1423-adjusting threaded rod; 1424-abutment; 1111-aluminum top supporter; 1112-adjusting screw; 1113-scale; 1111A-outer aluminum top supporter; 1111B-inner aluminum top supporter; 117-ladder; 121-moving roller; 13112-clamping annular groove; 1312-rotary handle; 1321-circular through-pipe; 1322-base bottom board; 1323-base side board; 1324-first reinforcing board; 1351-bracing bottom board; 1352-bracing side board; 1353-second reinforcing board; 13521-reinforcing threaded hole; 1331-bracing hole.

Detailed Implementation of the Invention

A number of implementations of the present invention will be disclosed below in conjunction with the accompanying figures. For the sake of clarity, many practical details will also be explained in the following description. However, it should be appreciated that these practical details should not be used to limit the present invention. In other words, in some implementations of the present invention, these practical details are not necessary. Besides, in order to simplify the accompanying figures, some conventional structures and components will be illustrated in the accompanying figures in a simple schematic manner.

It should be noted that all the directional indications (e.g., up, down, left, right, front, behind, etc.) set forth in the implementation of the present invention are merely used for explaining relative positional relationships, motion conditions and like among various components under a particular posture (e.g., as shown in the figures), and if this particular posture changes, these directional indications also change accordingly.

In addition, in the present invention, the descriptions such as those involving "first",

2019100147 25 Feb 2019

"second" and the like are used merely for the purpose of description. They are not used for referring specifically to sequences or the order of precedence, nor are they used for limiting the present invention. Rather, these descriptions are merely used for distinguishing between components or operations described using the same technical term, and cannot be construed as indicating or implying their relative significance, or implicitly stating the number of indicated technical features. Therefore, features defining "first" and "second" may expressly or implicitly comprise at least one of these features. Moreover, technical solutions among various implementation may be combined with one another, but this must be done on the basis that such combinations can be achieved by those technicians. When combinations of technical solutions are mutually conflicting or cannot be achieved, it should be considered that such combinations of technical solutions do not exist, nor do they fall within the scope of protection as set forth in the present invention.

Implementations:

The implementation of the present invention provides a movable and strong applicable of a fast moving installation supporting system, which is mainly used for supporting of a floor molding formwork 20, such that the floor is solidified and formed after pouring of concrete is completed.

Referring to Figure 1, illustrated is a structural schematic diagram of a movable support device in accordance with the implementation.

The fast moving installation supporting system comprises a number of movable support devices 10. Each movable support device 10 comprises a support device 11, a movable device 12, a support anchor device 13 and an angle bracket device 14, wherein the support device 11 is used for providing support and installation, on which the movable device 12, the support anchor device 13 and the angle bracket device 14. The movable device 12 is used for the present invention with a moving function, such that after the task of supporting and setting is finished, the present invention can be rapidly moved to a next working region. The support anchor device 13 is used for supporting a floor molding formwork 20 for a building floor; the angle bracket device 14 is used for supporting and fixing a molding formwork 20 applied to a beam structure of a floor. In order to make action force more uniform distribution to the molding formwork 20 by the support anchor device 13 and the angle bracket device 14, the support anchor device 13 and the angle bracket device 14 come into contact with the molding formwork 20 through a support beam 30. The movable device 12 can dismantle and install at the bottom of the support device 11, and the support anchor device 13 and the angle bracket device 14 can be respectively dismantled and installed on the top of the support device 11.

With continued reference to Figure 1 and Figure 2, Figure 2 is a top view of a mounting flat

plate in accordance with the implementation. The support device 11 comprises a supporting structure 111, a connecting bracket 112, at least one working platform 113, at least one skirting board 114, an aluminum I-shaped board 115 and a mounting flat plate 116, wherein the connecting bracket 112 is equipped with the supporting structure 111; at least one working platform 113 is installed on the connecting bracket 112; at least one skirting board 114 is installed on at least one working platform 113, and located on one side of the supporting structure 111, wherein the numbers of working platforms 113 and skirting boards 114 are set which based on the demand of on-site construction; the aluminum I-shaped board 115 is equipped on the top of the supporting structure 111; the mounting flat plate 116 is installed above the aluminum I-shaped board 115, wherein the mounting flat plate 116 is equipped with a number of mounting threaded holes 1161 which arranged at intervals; the movable device is installed at the bottom of the supporting structure 111; the angle bracket device is installed on the mounting flat plate 116 using the mounting threaded holes 1161. The overall height of the support device 11 can be adjusted by adjusting the supporting structure 111, such that the present invention is suitable for different heights of supporting floors.

Referring to Figures 1, 3, 4, 5 and 6, Figures 3-6 are, a main view of a support anchor device, a side view of the support anchor device, a top view of a rotary adjustable device, and a structural schematic diagram of a channel in accordance with the implementation. The support anchor device 13 comprises a rotary adjustable device 131, a base 132, a channel 133, a bracing strut 134 and a brace 135, wherein the rotary adjustable device 131 comprises a rotary unit 1311; a middle portion of the rotary unit 1311 is equipped with a rotary hole 13111; the rotary hole 13111 passes through the rotary unit 1311; an inner wall of the rotary hole 13111 is equipped with an internal thread; the rotary unit 1311 is equipped on the top of the base 132; the bottom end of the base 132 is equipped with the channel 133; the bottom of the channel 133 is connected with the mounting flat plate 116; the channel 133 is equipped with at least one bracing hole 1331; the bracing strut 134 is equipped with an external thread mated with the internal thread; one side of the bracing strut 134 penetrates through the rotary unit 1311, the base 132, the bracing hole 1331 and the mounting flat plate 116, wherein the bracing strut 134 penetrates through a mounting threaded hole 1161 of the mounting flat plate 116, and the other side of the bracing strut 134 is connected with the brace 135.

Referring to Figures 1 and 7, Figure 7 is a side view of an angle bracket device in accordance with the implementation. The angle bracket device 14 comprises a number of angle brackets 141, and the bottom of each angle bracket 141 is equipped with a number of angle bracket fixing threaded holes 1411. The angle bracket fixing threaded holes 1411 and mounting threaded holes 1161 are connected by screws, such that the angle brackets 141 can be respectively dismantled and

installed on the mounting flat plate 116. Side boards of a molding formwork 20 that correspond to a beam structure are fixed using a number of angle brackets 141. In another implementation, in order to reinforce the fixing of angle brackets 141 for a molding formwork 20, the angle bracket device 14 also comprises a number of angle bracket reinforcing devices 142 corresponding to the angle brackets 141, and each angle bracket reinforcing device 142 comprises an corner iron 1421, a pin 1422, an adjusting threaded rod 1423 and an abutment 1424, wherein a top of the pin 1422 is fixed on the corner iron 1421 by welding, and the bottom end of the pin 1422 penetrates through a corresponding mounting threaded hole 1161 on the mounting flat plate 116 and is fixed by an insert, such that the corner iron 1421 is fixed on one side of a corresponding angle bracket 141 that is away from the molding formwork 20; the adjusting threaded rod 1423 penetrates through the corner iron 1421 in a threaded manner, and the abutment 1424 is fixed on an end thereof; the abutment 1424 has a flat surface, and the adjusting threaded rod 1423 is rotated to move towards the angle bracket 141 relative to the corner iron 1421, such that eventually, the flat surface of the abutment 1424 abuts against a side surface of the angle bracket 141, thereby reinforcing the fixing of the angle bracket 141 for side boards of the molding formwork 20 that correspond to the beam structure.

Referring to Figures 8-10, they are, respectively, a first reference diagram for the use of a fast moving installation supporting system, a top view of a movable support device in Figure 8, and a second reference diagram for the use of the fast moving installation supporting system in accordance with the implementation.

When the fast moving installation supporting system is used, the number of movable support devices 10, the numbers of support anchor devices 13 and angle bracket devices 14, and positions thereof on the movable support devices 10 are set which based on floor molding formwork 20 for a floor to be poured. During mounting of floor molding formwork 20, mounting of a movable device 12 is not required. The bottom board of a molding formwork 20 corresponding to a beam structure portion is supported by a mounting flat plate 116, and side boards of the molding formwork 20 corresponding to the beam structure portion are fixed by an angle bracket device 14. Moreover, a molding formwork 20 corresponding to a floor is fixed by a support anchor device 13. During adjustment of the support anchor device 13, when the rotary unit 1311 is whirled, under the action of the threaded connection between the bracing strut 134, and the rotary hole 13111, is rotatably retractable in the direction of its central axis; eventually, the brace 135 is pressed against the molding formwork 20 corresponding to the floor. As such, the floor molding formwork 20 is installed on the fast moving installation supporting system. Moreover, the height of the supporting structure 111 is adjusted based on building requirements, such that the overall height of the floor molding formwork 20 meets the building design requirements. Then, after concrete is poured, the

support anchor device 13, the angle bracket device 14 and the molding formwork 20 are dismantled after the concrete is solidified and formed. After that, the present invention is separated from a formed concrete floor by adjusting the height of the supporting structure 111. Then, the movable device 12 is installed at the bottom of the supporting structure 111, and the present invention is moved to a next position to be poured by the movable device 12. Thereafter, after the movable device 12 is dismantled, the above-mentioned steps are repeated to achieve support for another floor.

Further, referring to Figures 1, 11, 12 and 13, Figures 11, 12 and 13 are, a structural schematic diagram of a supporting structure, a structural schematic diagram of an outer aluminum top supporter, and a structural schematic diagram of an inner aluminum top supporter in accordance with the implementation. The supporting structure 111 comprises a number of aluminum top supporters 1111, a number of adjusting screws 1112 and a number of scales 1113, and the number of adjusting screws 1112 are equipped with the number of aluminum top supporters 1111. The number of scales 1113 are equipped with the number of aluminum top supporters 1111 and located on one sides of the number of adjusting screws 1112. Every two adjacent aluminum top supporters 1111 are connected by a connecting bracket 112, such that a number of aluminum top supporters 1111 are fixed together. During the specific application, a single aluminum top supporter 1111 comprises an outer aluminum top supporter 1111A and an inner aluminum top supporter 1111B, and the inner aluminum top supporter 1111B is inlaid in the interior of the outer aluminum top supporter 1111A. As such, the manner for adjusting the height of the support device 11 may be as follows: first, a number of adjusting screws 1112 are loosened; then, the length of the inner aluminum top supporter 1111B that is inlaid in the outer aluminum top supporter 1111A is adjusted according to marks of a number of scales 1113; after the length of the inner aluminum top supporter 1111B that is inlaid in the outer aluminum top supporter 1111A reaches a predetermined value, the number of adjusting screws 1112 are tightened, thereby reaching the purpose of adjusting the height of the movable support device 10.

Further, with continued reference to Figure 1, the support device 11 also comprises a ladder 117 which arranged on one side of the supporting structure 111 and connected with at least one working platform 113 and the ground. The ladder 117 makes it convenient for operating worker to climb up and down, and for materials to be delivered to and from, the working platform 113, thereby improving the working efficiency and reducing the risk encountered by the operating worker when climbing up and down the working platform 113. When the movable support device 10 needs to be moved to another position, the ladder 117 can be retracted, it can make it convenient for operating worker to move the movable support device 10.

Further, with continued reference to Figure 1, the movable device 12 comprises a number of

moving rollers 121 can dismantle and install at the bottom of a number of aluminum top supporters 1111 by screws, and the number of the number of moving rollers 121 corresponds to that of the number of aluminum top supporters 1111. When the movable support device 10 needs to be moved, a number of moving rollers 121 are installed correspondingly at the bottom of a number of aluminum top supporters 1111 by operating worker, such that they can rapidly push the movable support device 10 to a predetermined position with little effort. After the movable support device 10 is moved to the predetermined position, the movable device 12 is removed by the operating worker, and the movable support device 10 can then be put into use, it can improve the overall construction efficiency.

Further, with continued reference to Figure 5, in order to render the fixing of the rotary unit 1311 on the top of the base 132 more stable and its rotating process smoother, the rotary unit 1311 also comprises a clamping annular groove 13112 which equipped with one side of the rotary unit 1311 and arranged annularly around the rotary hole 13111, wherein the minimum inner diameter of the clamping annular groove 13112 is greater than the hole diameter of the rotary hole 13111, and the rotary unit 1311 is equipped on the top of the base 132 through the clamping annular groove 13112. In addition, it should be noted that in order to further reinforce the connection between the rotary unit 1311 and the base 132, the clamping annular groove 13112 is designed to have a step-shaped cross-section, and the top of the base 132 is also designed to be of a matched stepped shape.

Further, with continued reference to Figure 5, in order to render the rotation of the rotary unit 1311 more convenient and labor-saving, the rotary adjustable device 131 also comprises at least one rotary handle 1312. At least one rotary handle 1312 is fixed on an outer wall of the rotary unit 1311, such that with this rotary handle 1312, operating worker can conduct rotation more easily and quickly.

Further, with continued reference to Figures 3 and 4, the base 132 comprises a circular through-pipe 1321, a base bottom board 1322 and two base side boards 1323. The circular through-pipe 1321 penetrates through the base bottom board 1322 and the bracing hole 1331, and the two base side boards 1323 are connected perpendicularly to the base bottom board 1322. In other words, the bottom of the base 132 is designed to be of a U-shaped structure, such that it is well mated with the overall shape of the channel 133. The bottom surface of the base bottom board 1322 cooperates with inner side surfaces of the two base side boards 1323 to form a base bracing groove, and the bracing strut 134 penetrates through the circular through-pipe 1321. The fixing between the base 132 and the channel 133 is reinforced by making the circular through-pipe 1321 pass through the bracing hole 1331. Meanwhile, as the circular through-pipe 1321 itself is of an elongated shape, the bracing strut 134 is firmer when penetrating through the circular

through-pipe 1321 of an elongated shape. Specifically, the base 132 also comprises at least one first reinforcing board 1324 connected respectively with the circular through-pipe 1321 and the base 132 bottom board, and the support strength of the base 132 is improved by the first reinforcing board 1324.

Further, with continued reference to Figures 3 and 4, the brace 135 comprises a bracing bottom board 1351 and two bracing side boards 1352 which are connected vertically with the bracing bottom board 1351 in a perpendicular manner, wherein a top surface of the bracing bottom board 1351 cooperates with inner side surfaces of the two bracing side boards 1352 to form a supporting bracing groove, i.e. that the brace 135 is designed to be of a U-shaped structure, and one side of the bracing strut 134 is connected to the bottom surface of the bracing bottom board 1351. The brace 135 is designed to be of a U-shaped structure, such that it is well mated with the shape of a support beam. When the support beam is supported by the supporting bracing groove having such a U-shaped structure, its fixing effects may be effectively improved, such that it is less susceptible to loosening and displacement. Specifically, the brace 135 also comprises at least one second reinforcing board 1353 which is connected respectively with the bracing bottom board 1351 and the brace 135, and the support strength of the brace 135 is improved by the second reinforcing board 1353. In addition, in this implementation of present invention, the bracing side boards 1352 are equipped with at least one reinforcing threaded hole 13521. After the brace 135 is pressed against the support beam 30 of an upper floor, it may be fixed, via screws, on the support beam 30 through the reinforcing threaded holes 13521, thereby further reinforcing the fixing between the present invention and the support beam 30.

With continued reference to Figures 8-10, the channel 133 is vertical to the mounting flat plate 116, the base 132 bracing groove is equipped with the channel 133, and the circular through-pipe 1321 is made to penetrate through the bracing hole 1331. The rotary unit 1311 is whirled by the rotary handle 1312, such that the bracing strut 134 stretches upwards in an axis direction thereof until the supporting bracing groove is equipped with the support beam 30 of a corresponding upper floor molding formwork 20. After that, the positioning and supporting process is completed. In this implementation, the same channel 133 is equipped with a number of bracing holes 1331, and each bracing hole 1331 corresponds to a group consisting of a rotary adjustable device 131, a base 132, a bracing strut 134 and a brace 135. This can save design costs.

Furthermore, referring to Figure 14, illustrated is a main view of a support anchor device in accordance with the implementation. The brace 135 may apply a truncated-cone structure, wherein the area for the top surface is greater than that for the bottom surface. When the present invention is required to support an upper molding formwork 20 without any dependence on the support beam 30, the brace 135 having a truncated-cone structure can effectively enhance the support and

2019100147 25 Feb 2019

fixing effects of the support anchor device 13.

In conclusion, the fast moving installation supporting system of the invention is equipped with a height-adjustable support anchor device 13, which can be retractable in height by whirling the rotary adjustable device 131 of the support anchor device 13, so that the invention can be suitable to the different floor heights and provide support of different heights. Meanwhile, the invention is equipped with a movable device, which enables the invention to perform rapid moving and increase the progress of construction.

What have been described above are merely implementations of the present invention, which are not used to limit the present invention. For those technicians, the present invention may be subjected to various modifications and changes. All the amendments, equivalent substitutions, improvements and so on, which are made without departing from the spirit and principle of the present invention, shall be covered by the scope as set forth in the claims of the present invention.

2019100147 18 Jun 2019

Claims

1. An installation supporting system comprising a number of movable support devices (10), characterized in that each of the movable support devices (10) comprises a support device (11), a movable device (12), a support anchor device (13) and an angle bracket device (14), wherein the movable device (12) can be dismantled and installed at a bottom of the support device (11); the support anchor device (13) and the angle bracket device (14) can be dismantled and installed on a top of the support device (11);

wherein the support device (11) comprises a supporting structure (111), a connecting bracket (112), at least one working platform (113), at least one skirting board (114), an aluminum I-shaped board (115) and a mounting flat plate (116); the connecting bracket (112) is coupled with the supporting structure (111); the at least one working platform (113) is installed on the connecting bracket (112); the at least one skirting board (114) is installed on the at least one working platform (113) and located on one side of the supporting structure (111); the aluminum I-shaped board (115) is provided on a top of the supporting structure (111); the mounting flat plate (116) is installed above the aluminum I-shaped board (115); the movable device (12) is installed at a bottom of the supporting structure (111); the angle bracket device (14) is installed on the mounting flat plate (116);

wherein the support anchor device (13) comprises: a rotary adjustable device (131), a base (132), a channel (133), a bracing strut (134) and a brace (135); the rotary adjustable device (131) comprises a rotary unit (1311); a middle portion of the rotary unit (1311) is equipped with a rotary hole (13111); the rotary hole (13111) passes through the rotary unit (1311); an inner wall of the rotary hole (13111) is equipped with an internal thread; the rotary unit (1311) is provided on a top of the base (132); a bottom of the base (132) is provided with the channel (133); the channel (133) is equipped with at least one bracing hole (1331); the bracing strut (134) is equipped with an external thread mated with the internal thread; a first portion of the bracing strut (134) penetrates through the rotary unit (1311), the base (132), the bracing hole (1331) and the mounting flat plate (116), and a second portion of the bracing strut (134) is connected with the brace (135).

2. The installation system according to claim 1, characterized in that the base (132) comprises: a circular through-pipe (1321), a base bottom board (1322) and two base side boards (1323), wherein the circular through-pipe (1321) penetrates through the base bottom board (1322) and the bracing hole (1331); the two base side boards (1323) are connected perpendicularly to the base bottom board (1322); a bottom surface of the base bottom board (1322) cooperates with inner side surfaces of the two base side boards (1323) to form a base bracing groove; and the bracing strut (134) penetrates through the circular through-pipe (1321).

2019100147 18 Jun 2019

3. The installation system according to claim 2, characterized in that the base (132) also comprises at least one first reinforcing board (1324), wherein the first reinforcing board (1324) is connected respectively with the circular through-pipe (1321) and the base bottom board (1322).

4. The installation system according to claim 1, characterized in that the brace (135) comprises a bracing bottom board (1351) and two bracing side boards (1352) connected respectively with the bracing bottom board (1351) in a perpendicular manner, wherein a top surface of the bracing bottom board (1351) cooperates with inner side surfaces of the two bracing side boards (1352) to form a supporting bracing groove; and the second portion of the bracing strut (134) is connected to a bottom surface of the bracing bottom board (1351).

5. The installation system according to claim 1, characterized in that the brace (135) is of a truncated-cone structure.

2019100147 13 Feb 2019

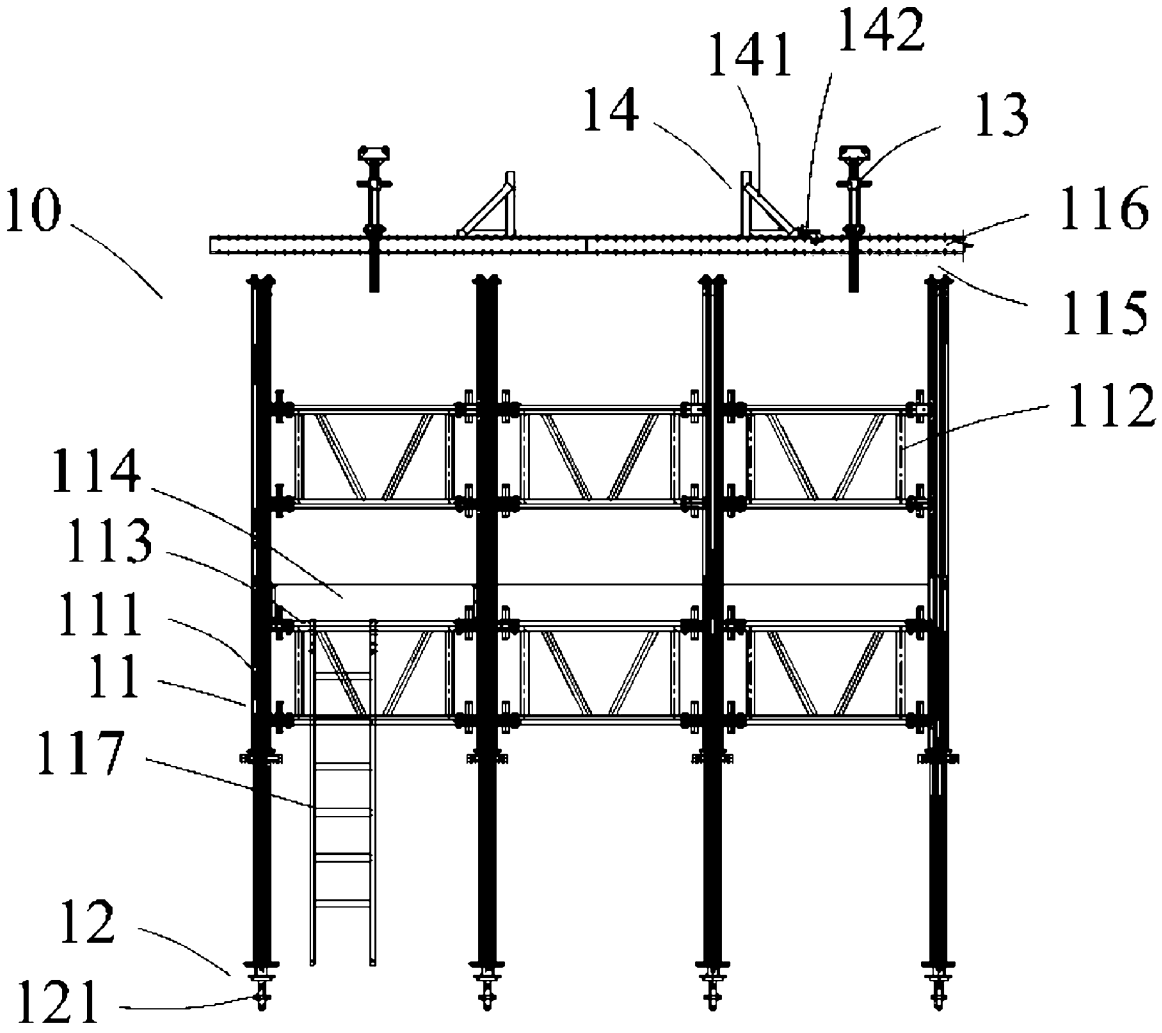


Figure 1

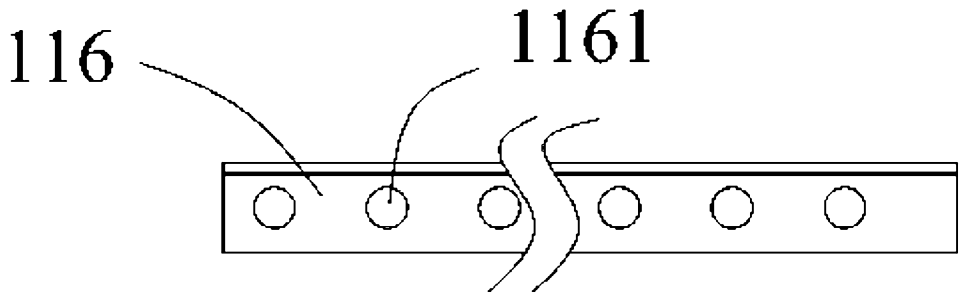


Figure 2

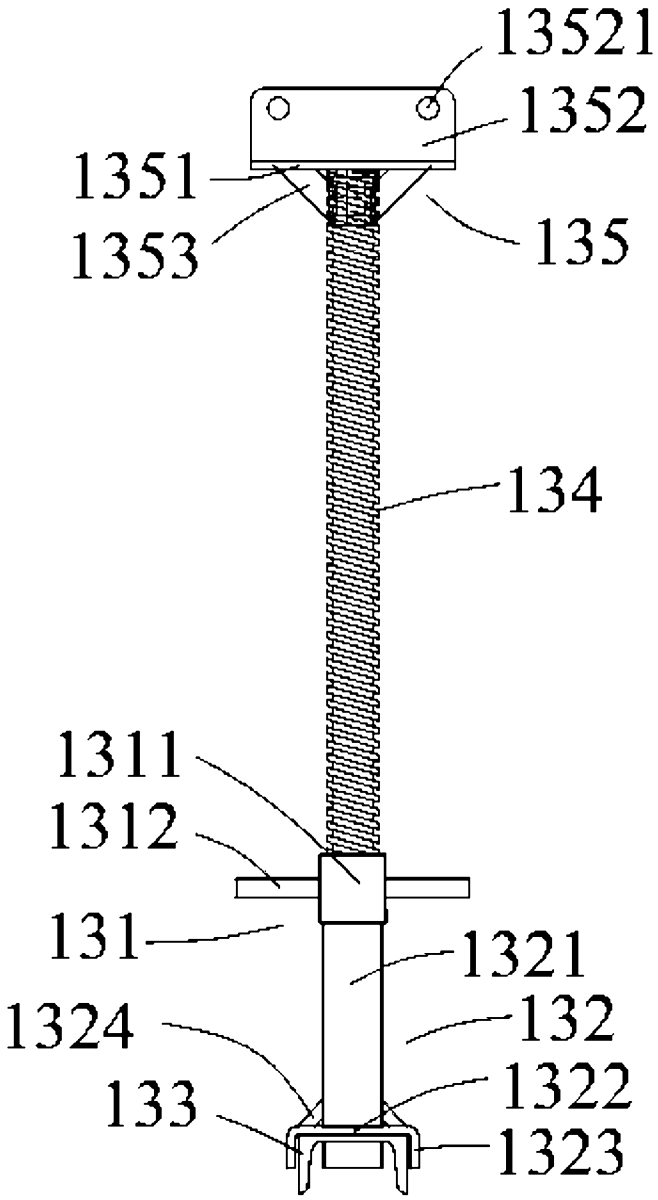

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Figure 3

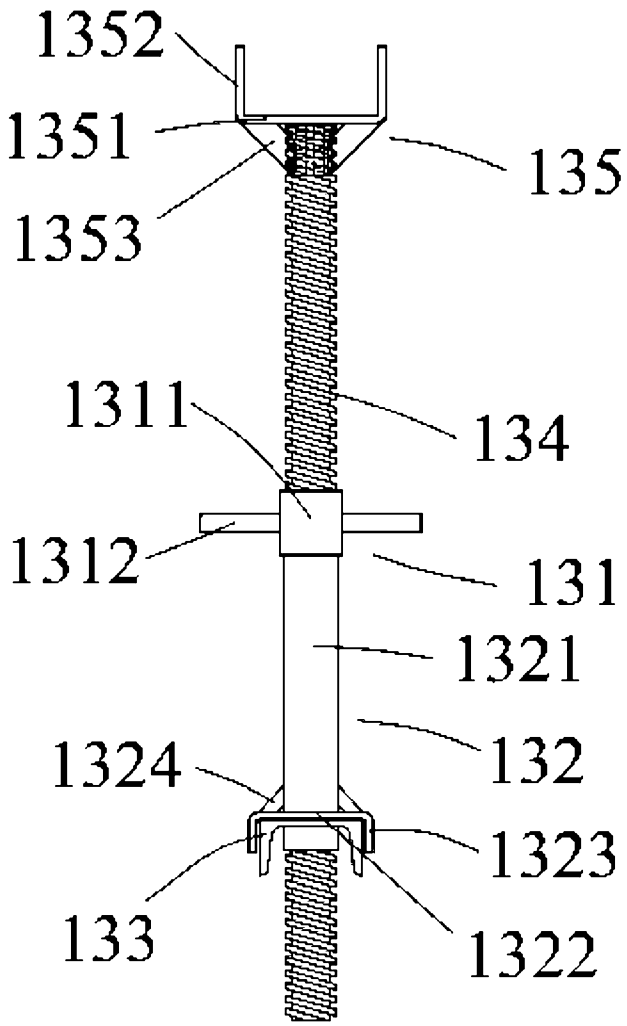


Figure 4

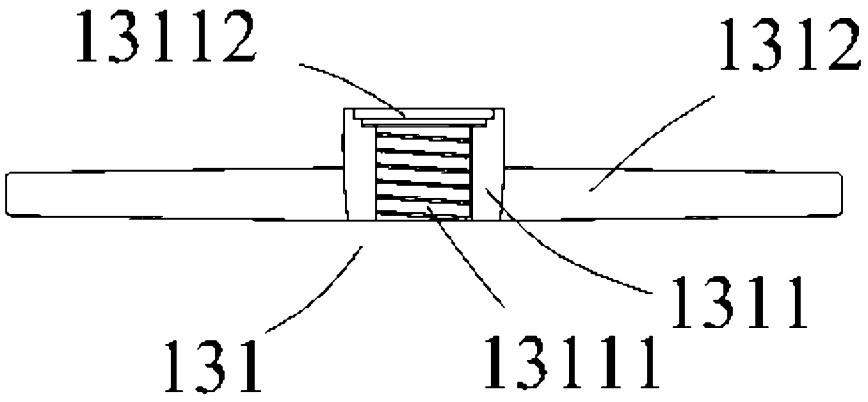


Figure 5

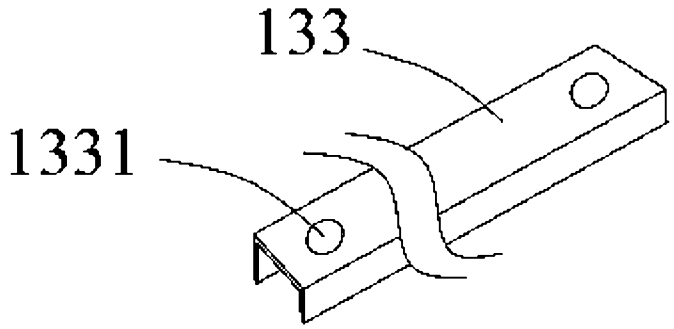


Figure 6

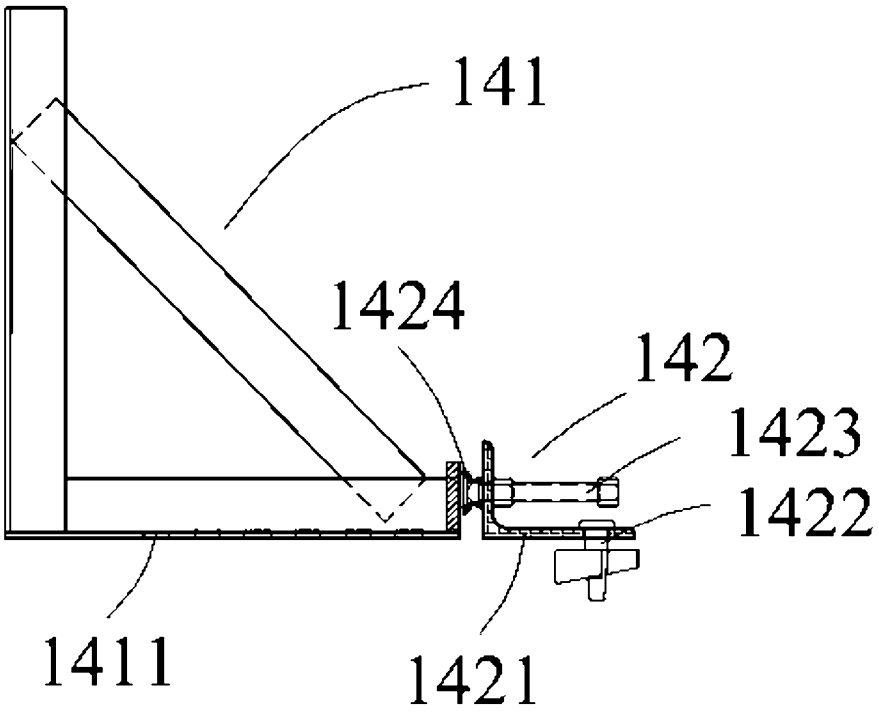


Figure 7

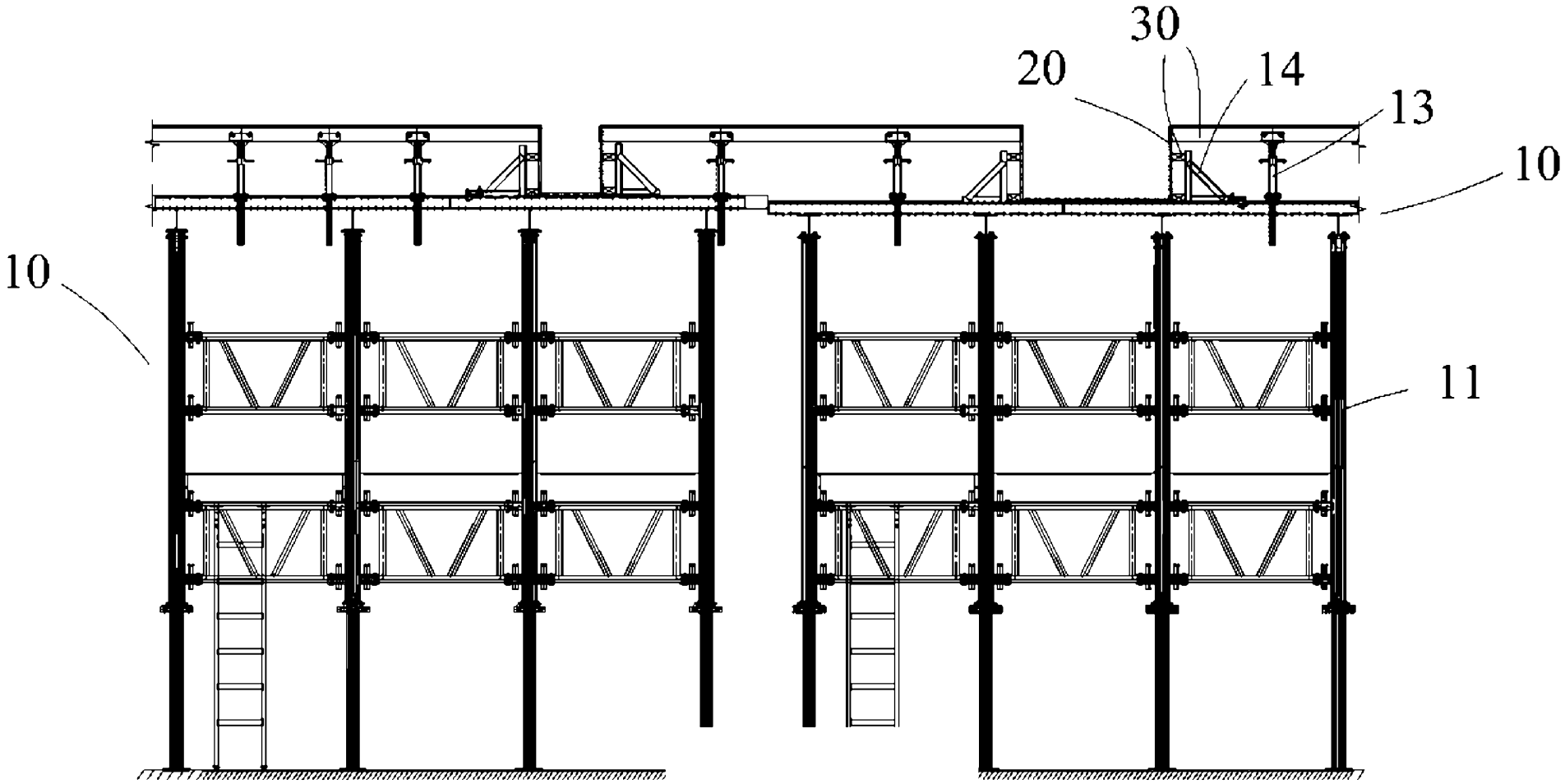


Figure 8

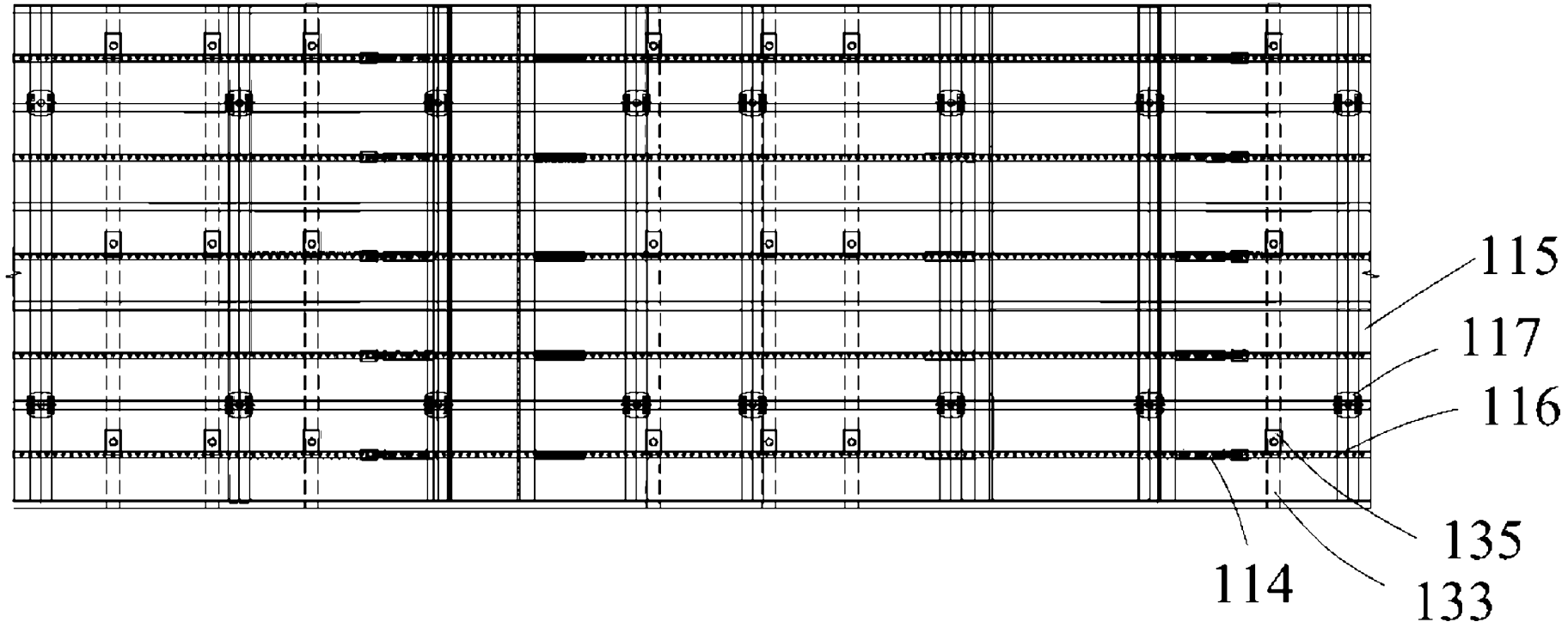


Figure 9

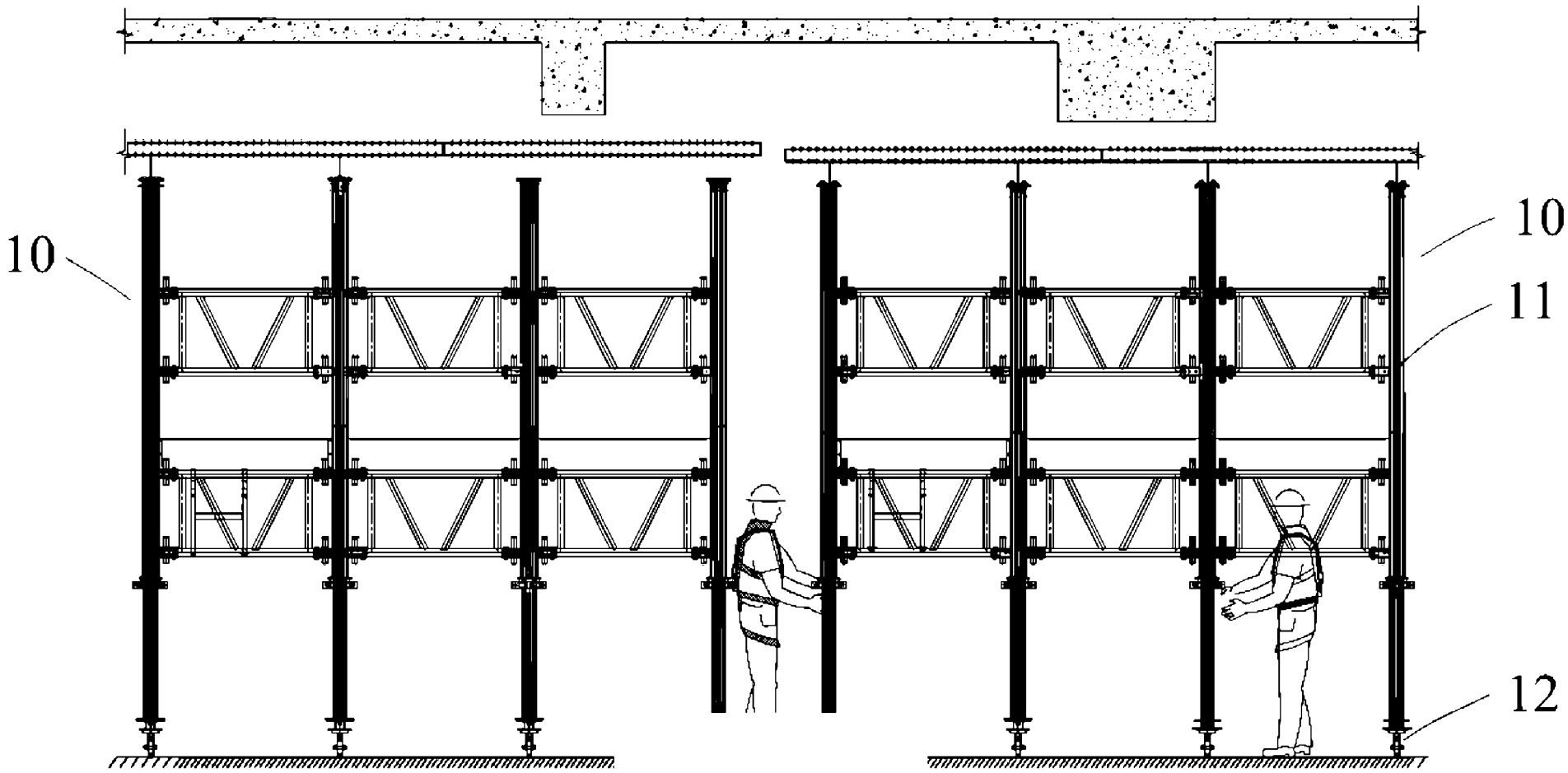


Figure 10

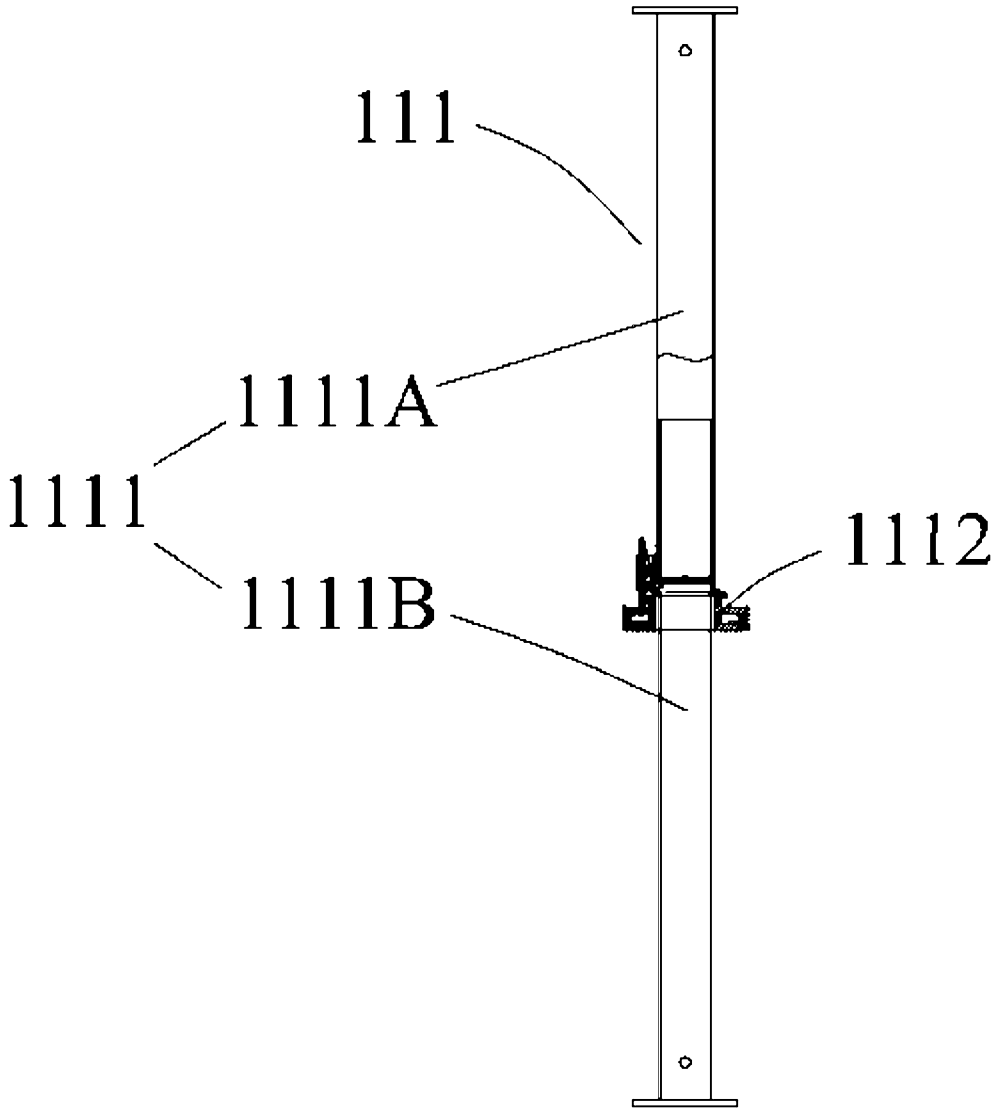


Figure 11

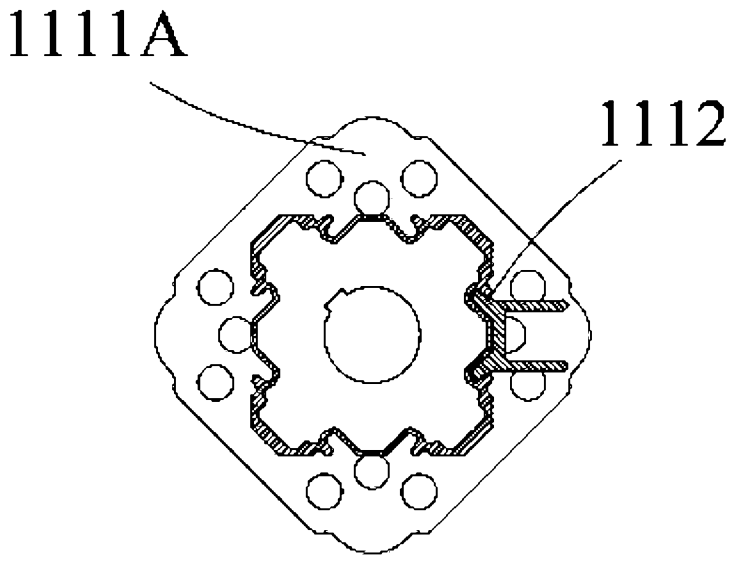


Figure 12

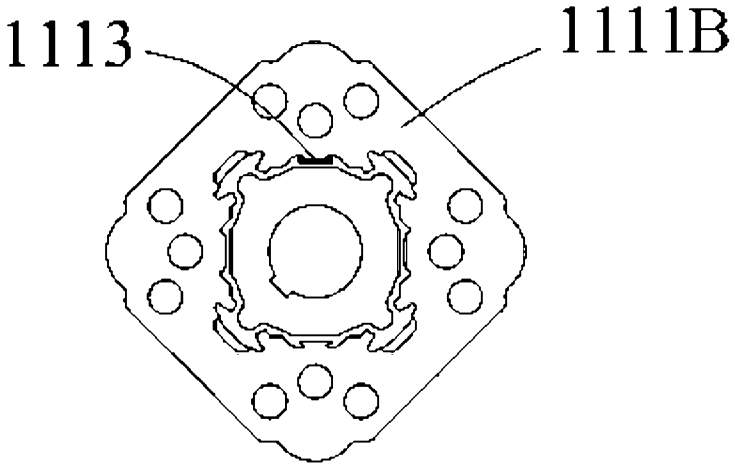


Figure 13

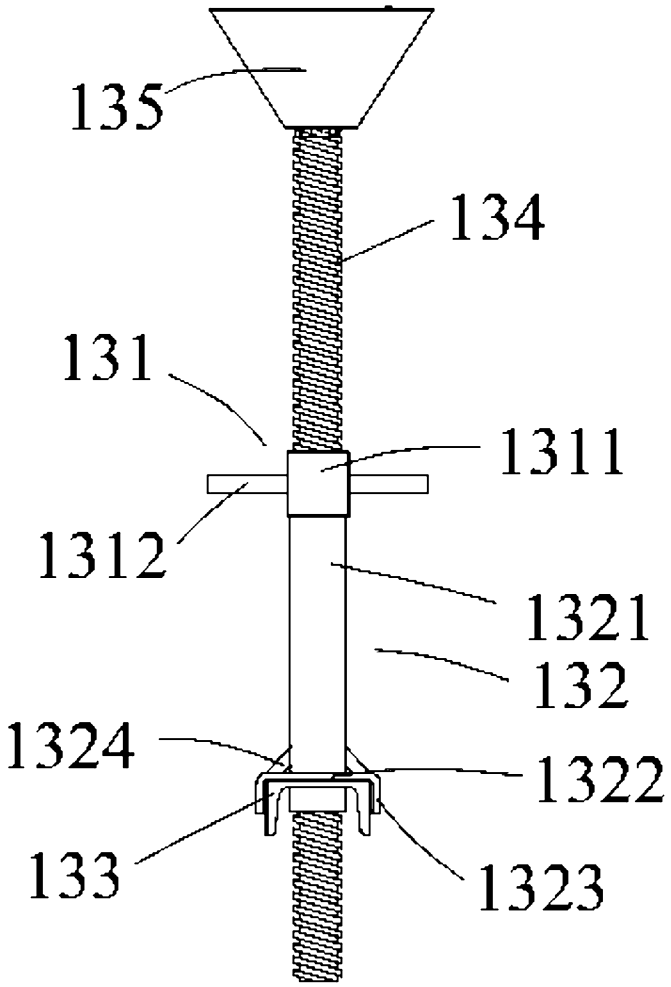


Figure 14