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(54) **Module pre-installed offshore booster station.**

(57) A module pre-installed offshore booster station including a support base, a booster station platform installed on the support base, and pre-installation modules installed on the booster station platform. The pre-installation module includes a main transformer module, a GIS component module, a diesel generator module, a storage battery module, a low-voltage distribution module, a low-voltage communication module, a secondary equipment module and a station electricity equipment module. A parking apron platform and a crane platform are respectively arranged on both sides of the top of the pre-installation module. A jib crane is arranged on the crane platform. The pre-installation modules are respectively arranged in a prefabricated container body that is respectively independently closed. Container corner fittings are arranged at four corners of the top and bottom of the prefabricated container. A self-locking mounting base is fixedly arranged at a position of the booster station platform corresponding to the container corner fittings.

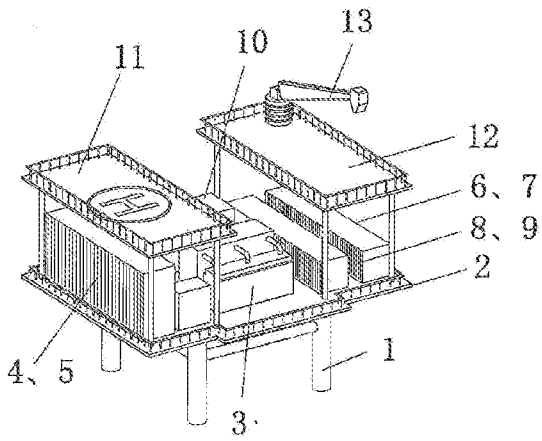

FIG. 1

DESCRIPTION

MODULE PRE-INSTALLED OFFSHORE BOOSTER STATION

TECHNICAL FIELD

The present invention relates to the technical field of booster stations and particularly relates to a module pre-installed offshore booster station.

BACKGROUND OF THE PRESENT INVENTION

Wind power generation is one of the most major renewable energy sources. Through several decades of development, an onshore wind power technology has been very mature. Offshore wind power generation is a new direction for global energy development, and is also a high-point of the wind power generation technology. The onshore wind power generation has been developed on a large scale in China. An installation scale has ranked first in the world. However, development of offshore wind power is just getting started. A booster station is an important component of an electrical system in a wind power plant, and takes on a heavy responsibility of electric power transmission in the wind power plant. When an offshore wind plant is high in capacity and far offshore, generally an offshore booster station needs to be constructed. After electric energy generated by a wind generation set gathers, the electric energy is boosted to a higher voltage class to be transmitted to an onshore power grid. At present, the offshore booster station has no unified standard and structure, but the structural form of the offshore booster station has great influences on installation, transmission, operation and maintenance and economical efficiency.

Therefore, a present invention patent having the patent application number of CN201520095751.6 discloses a "module pre-installed offshore booster station".

According to the booster station, components and modules of each booster station are separately installed by adopting standardized containers, so that the booster station is convenient to transport, and manufacturing and post-installation cost is reduced. However, in actual applications, since the standardized containers are fixed by four-angle corner fittings, in the traditional fixing manner, the containers are fixed by twist locks or lashing bars generally. The traditional twist locks are generally used for fixing the containers on the upper and lower layers or adjacent containers and cannot stably fix the container bodies on a deck of the booster station platform, while the lashing bars need to be attached to outer walls of the containers, thereby hindering the arrangement of container doors and cable pipelines.

Based on this, the present invention designs a module pre-installed offshore booster station for solving the above problems.

SUMMARY OF THE PRESENT INVENTION

A purpose of the present invention is to provide a module pre-installed offshore booster station, for solving the above problems.

In order to realize the above purpose, the present invention provides the following technical solutions: the module pre-installed offshore booster station includes a support base, a booster station platform installed on the support base, and pre-installation modules installed on the booster station platform. The pre-installation module includes a main transformer module, a GIS component module, a diesel generator module, a storage battery module, a low-voltage distribution module, a low-voltage communication module, a secondary equipment module and a station electricity equipment module. A parking apron platform and a crane platform are respectively arranged on both sides of the top of the pre-installation module. A jib crane is arranged on the crane platform.

The pre-installation modules are respectively arranged in a prefabricated container body that is respectively independently closed. Container corner fittings are arranged at four corners of the top and the bottom of the prefabricated container. A self-locking mounting base is fixedly arranged at a position of the booster station platform corresponding to the container corner fittings at the bottom of each prefabricated container.

Preferably, each prefabricated container is provided with a movable door; and interior lighting, interior trim, heating and ventilation and air-conditioning equipment are arranged in the prefabricated container body.

Preferably, the self-locking mounting base includes a square shell base with a top opening; a trigger casing is arranged in the center of an inner cavity of the square shell base; the bottom of an inner cavity of the trigger casing is in movable installation and connection with the bottom of the square shell base by penetrating a fixed sliding column; chute lugs are fixedly arranged outside two adjacent sides of the trigger casing; self-locking pressing plates are arranged at hinged joints of two corresponding sides of the square shell base and the chute lugs; the outer sides of the self-locking pressing plates are hinged with side walls of the square shell base by virtue of a stud shaft; the inside end of the self-locking pressing plate is hinged with the chute lugs by virtue of pin shaft bolts; and self-locking convex blocks matched with slotted holes of container corner fittings are arranged on inner walls of the upper end of the self-locking pressing plate.

Preferably, a reset compressed spring is sleeved on the outer wall of the fixed sliding column, and abutted between the bottom of the trigger casing and the square shell base.

Preferably, the square shell base is formed by welding square bottom plates and

square surrounding walls; the square bottom plates are fixedly welded with the top surface of the booster station platform; and reinforcing rib plates are welded between peripheral outer walls of the square surrounding walls and top surfaces of the square bottom plates.

Preferably, totally two self-locking pressing plates are in mirror images with each other; each self-locking pressing plate includes an L-shaped pressing plate main body; the self-locking convex blocks are arranged on inner sides of upper ends of the L-shaped pressing plate main bodies; outer pin holes and inner pin holes are arranged at intervals at the bottoms of the L-shaped pressing plate main bodies; the inner pin holes are matched with pin shaft bolts; and locking lugs are arranged at the upper ends of the L-shaped pressing plate main bodies along a horizontal plane in an outward extending manner.

Preferably, the stud shaft includes a pin rod, a thread stud and an outer hexagonal part that are coaxially arranged in sequence; and the pin rod, the thread stud and the outer hexagonal part are of an integral structure.

Compared with the prior art, the present invention has beneficial effects as follows:

The module pre-installed offshore booster station in the present invention mainly includes the support base, the booster station platform and the pre-installation module; the self-locking mounting base is fixedly arranged at the position of the booster station platform corresponding to the container corner fittings at the bottom of each prefabricated container; the self-locking mounting base is specially used for stably fixing the prefabricated containers on the deck of the booster station platform; when the self-locking mounting base is used, by virtue of the automatic pushed trigger casing of the prefabricated containers and the pre-installed module, the self-locking pressing plates on the both sides are forced to be in attached abutment with the container corner

fittings so as to achieve a lateral limiting and fixing effect; the locking lugs are arranged at the upper ends of the L-shaped pressing plate main bodies in the self-locking mounting base along the horizontal plane in the outward extending manner; the two groups of locking lugs are attached to each other after the prefabricated containers are placed; and the prefabricated containers and the locking lugs are coaxially penetrated by virtue of simple latch levers or bolts, thereby achieving a locking effect. The self-locking mounting base adopted in the booster station has structural characteristics as follows: firstly, if only the prefabricated containers are not lifted up, that is, the booster station has no lateral offset, such a fixing manner has an advantage that, the pre-installed module can be effectively prevented from loosening under stress when a typhoon at sea blows or the ground shakes; and secondly, the latch levers or bolts for locking cannot directly bear the stress, and the problem that the traditional bolts are difficult to remove and maintain after direct fixation and later corrosion can be solved.

BRIEF DESCRIPTION OF THE DRAWINGS

To more clearly describe technical solutions in embodiments of the present invention, drawings to be used in descriptions of the embodiments will be briefly introduced below. Apparently, the described drawings below are merely part of the embodiments of the present invention, not all of the embodiments. All other drawings may be obtained by those ordinary skilled in the art in accordance with the above drawings without contributing creative labor.

Fig. 1 is a schematic diagram of an entire structure in the present invention;

Fig. 2 is a schematic diagram of an installation structure of a prefabricated container in the present invention;

Fig. 3 is a schematic diagram II of an installation structure of a prefabricated

container in the present invention;

Fig. 4 is a structural schematic diagram of a self-locking mounting base in the present invention;

Fig. 5 is a schematic diagram of an internal structure of a self-locking mounting base in the present invention;

Fig. 6 is a schematic diagram II of an internal structure of a self-locking mounting base in the present invention;

Fig. 7 is a structural schematic diagram of a self-locking pressing plate in the present invention; and

Fig. 8 is a structural schematic diagram of a stud shaft in the present invention.

In the figures, components represented by various symbols are listed as follows:

1: support base; 2: booster station platform; 3: main transformer module; 4: GIS component module; 5: diesel generator module; 6: storage battery module; 7: low-voltage distribution module; 8: low-voltage communication module; 9: secondary equipment module; 10: station electricity equipment module; 11: parking apron platform; 12: crane platform; 13: jib crane; 14: prefabricated container; 15: container corner fitting; 16: self-locking mounting base; 161: square shell base; 1611: square bottom plate; 1612: square surrounding wall; 1613: reinforcing rib plate; 162: trigger casing; 163: fixed sliding column; 164: chute lug; 165: self-locking pressing plate; 1651: L-shaped pressing plate main body; 1652: outer pin hole; 1653: inner pin hole; 1654: locking lug; 166: pin shaft bolt; 167: self-locking convex block; 168: stud shaft; 1681: pin rod; 1682: thread stud; 1683: outer hexagonal part; and 169: reset compressed spring.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

The technical solutions in the embodiments of the present invention will be clearly and fully described below in combination with drawings in the embodiments of the present invention. Apparently, the described embodiments are merely part of the embodiments of the present invention, not all of the embodiments. Based on the embodiments in the present invention, all other embodiments obtained by those ordinary skilled in the art without contributing creative labor will belong to the protection scope of the present invention.

Referring to Fig. 1, the present invention provides a technical solution as follows: a module pre-installed offshore booster station includes a support base 1, a booster station platform 2 installed on the support base 1, and a pre-installation module installed on the booster station platform 2. The pre-installation module includes a main transformer module 3, a GIS component module 4, a diesel generator module 5, a storage battery module 6, a low-voltage distribution module 7, a low-voltage communication module 8, a secondary equipment module 9 and a station electricity equipment module 10. A parking apron platform 11 and a crane platform 12 are respectively arranged on both sides of the top of the pre-installation module. A jib crane 13 is arranged on the crane platform 12.

Referring to Figs. 2-3, the pre-installation modules are respectively arranged in a body of the prefabricated container 14 that is respectively independently closed. Container corner fittings 15 are arranged at four corners of the top and the bottom of the prefabricated container 14. A self-locking mounting base 16 is fixedly arranged at a position of the booster station platform 2 corresponding to the container corner fittings 15 at the bottom of each prefabricated container 14.

Embodiment 1:

Further, each prefabricated container 14 is provided with a movable door; and interior lighting, interior trim, heating and ventilation and air-conditioning equipment are arranged in the prefabricated container 14 body.

Embodiment 2:

Further, referring to Figs. 4-6, the self-locking mounting base 16 includes a square shell base 161 with a top opening; a trigger casing 162 is arranged in the center of an inner cavity of the square shell base 161; the bottom of an inner cavity of the trigger casing 162 is in movable installation and connection with the square shell base 161 by penetrating a fixed sliding column 163; chute lugs 164 are fixedly arranged outside two adjacent sides of the trigger casing 162; self-locking pressing plates 165 are arranged at hinged joints of two corresponding sides of the square shell base 161 and the chute lugs 164; the outer sides of the self-locking pressing plates 165 are hinged with side walls of the square shell base 161 by virtue of a stud shaft 168; the inside end of each self-locking pressing plate 165 is hinged with the chute lugs 164 by virtue of pin shaft bolts 166; self-locking convex blocks 167 matched with slotted holes of container corner fittings 15 are arranged on inner walls of the upper ends of the self-locking pressing plates 165; a reset compressed spring 169 is sleeved on the outer wall of the fixed sliding column 163, and abutted between the bottom of the trigger casing 162 and the square shell base 161; the square shell base 161 is formed by welding square bottom plates 1611 and square surrounding walls 1612; the square bottom plates 1611 are fixedly welded with the top surface of the booster station platform 2; reinforcing rib plates 1613 are welded between peripheral outer walls of the square surrounding walls 1612 and top surfaces of the square bottom plates 1611; totally two self-locking pressing plates 165 are in mirror images with each other; each self-locking pressing plate 165 includes an L-shaped pressing plate main body 1651; the self-locking convex blocks 167 are arranged on inner sides of upper ends of the L-shaped pressing plate

main bodies 1651; outer pin holes 1652 and inner pin holes 1653 are arranged at intervals at the bottoms of the L-shaped pressing plate main bodies 1651; the inner pin holes 1653 are matched with pin shaft bolts 166; and locking lugs 1654 are arranged at the upper ends of the L-shaped pressing plate main bodies 1651 along a horizontal plane in an outward extending manner; and by virtue of the automatic pushed trigger casing 162 of the prefabricated containers 14 and the pre-installed module, the self-locking pressing plates 165 on the both sides are forced to be in attached abutment with the container corner fittings 15 so as to achieve a lateral limiting and fixing effect.

Referring to Fig. 7, totally two self-locking pressing plates 165 are in mirror images with each other; each self-locking pressing plate 165 includes an L-shaped pressing plate main body 1651; the self-locking convex blocks 167 are arranged on inner sides of the upper ends of the L-shaped pressing plate main bodies 1651; outer pin holes 1652 and inner pin holes 1653 are arranged at intervals at the bottoms of the L-shaped pressing plate main bodies 1651; the inner pin holes 1653 are matched with pin shaft bolts 166; and locking lugs 1654 are arranged at the upper ends of the L-shaped pressing plate main bodies 1651 along a horizontal plane in an outward extending manner; the two groups of locking lugs 1654 are attached to each other after the prefabricated containers 14 are placed; and the prefabricated containers and the locking lugs are coaxially penetrated by virtue of simple latch levers or bolts, thereby achieving a locking effect.

Referring to Fig. 8, the stud shaft 168 includes a pin rod 1681, a thread stud 1682 and an outer hexagonal part 1683 that are coaxially arranged in sequence; the pin rod 1681, the thread stud 1682 and the outer hexagonal part 1683 are of an integral structure; stepped holes matched with the stud shaft 168 are laterally formed in the square surrounding walls 1612; and during installation, the stud shaft 168 is laterally inserted into the square surrounding walls 1612 and fixedly screwed with one end of an internal

thread structure in the stepped hole by virtue of the thread stud 1682.

In descriptions of the present invention, it should be understood that, an orientation or position relation indicated by the terms such as "coaxial", "bottom", "one end", "top", "middle", "the other end", "upper", "one side", "top", "inner", "front", "center", "two ends" and the like is an orientation or position relation shown based on drawings. However, in order to conveniently describe the present invention and simplify the descriptions, rather than indicating or implying that the device or component must be provided with a specific orientation and be constructed and operated in the specific orientation. Therefore, the descriptions cannot be understood as a limitation of the present invention.

In the present invention, unless otherwise specified and defined, terms such as "install", "arrange", "connect", "fix" and "screw" should be generally understood, e.g., fixed connection, detachable connection, or integrated; mechanical connection or electrical connection or direct connection; indirect connection by virtue of an intermediate medium; or communication inside two components or interaction between two components. Unless otherwise defined, specific meanings of the above terms in the present invention may be understood by those ordinary skilled in the art according to specific circumstances.

Although embodiments of the present invention have been illustrated and described, it may be understood for those ordinary skilled in the art that, multiple changes, modifications, replacements and variations may be made to the embodiments without departing from the principle and spirit of the present invention. The scope of the present invention is limited by claims and equivalents thereof.

CLAIMS

1. A module pre-installed offshore booster station, comprising a support base (1), a booster station platform (2) installed on the support base (1), and pre-installation modules installed on the booster station platform (2), wherein the pre-installation module comprises a main transformer module (3), a GIS component module (4), a diesel generator module (5), a storage battery module (6), a low-voltage distribution module (7), a low-voltage communication module (8), a secondary equipment module (9) and a station electricity equipment module (10); a parking apron platform (11) and a crane platform (12) are respectively arranged on both sides of the top of the pre-installation module; and a jib crane (13) is arranged on the crane platform (12);

the pre-installation modules are respectively arranged in a body of a prefabricated container (14) that is respectively independently closed; container corner fittings (15) are arranged at four corners of the top and the bottom of the prefabricated container (14); and a self-locking mounting base (16) is fixedly arranged at a position of the booster station platform (2) corresponding to the container corner fittings (15) at the bottom of each prefabricated container (14).

2. The module pre-installed offshore booster station according to claim 1, wherein each prefabricated container (14) is provided with a movable door; and interior lighting, interior trim, heating and ventilation and air-conditioning equipment are arranged in the body of the prefabricated container (14).

3. The module pre-installed offshore booster station according to claim 1, wherein the self-locking mounting base (16) comprises a square shell base (161) with a top opening; a trigger casing (162) is arranged in the center of an inner cavity of the square shell base (161); the bottom of an inner cavity of the trigger casing (162) is in movable installation and connection with the bottom of the square shell base (161) by penetrating a fixed sliding column (163); chute lugs (164) are fixedly arranged outside two adjacent sides of the trigger casing (162); self-locking pressing plates (165) are

arranged at hinged joints of two corresponding sides of the square shell base (161) and the chute lugs (164); the outer sides of the self-locking pressing plates (165) are hinged with side walls of the square shell base (161) by virtue of a stud shaft (168); the inside end of the self-locking pressing plate (165) is hinged with the chute lugs (164) by virtue of pin shaft bolts (166); and self-locking convex blocks (167) matched with slotted holes of container corner fittings (15) are arranged on inner walls of the upper end of the self-locking pressing plate (165).

4. The module pre-installed offshore booster station according to claim 3, wherein a reset compressed spring (169) is sleeved on the outer wall of the fixed sliding column (163), and abutted between the bottom of the trigger casing (162) and the square shell base (161).

5. The module pre-installed offshore booster station according to claim 3, wherein the square shell base (161) is formed by welding square bottom plates (1611) and square surrounding walls (1612); the square bottom plates (1611) are fixedly welded with the top surface of the booster station platform (2); and reinforcing rib plates (1613) are welded between peripheral outer walls of the square surrounding walls (1612) and top surfaces of the square bottom plates (1611).

6. The module pre-installed offshore booster station according to claim 3, wherein totally two self-locking pressing plates (165) are in mirror images with each other; each self-locking pressing plate (165) comprises an L-shaped pressing plate main body (1651); the self-locking convex blocks (167) are arranged on inner sides of upper ends of the L-shaped pressing plate main bodies (1651); outer pin holes (1652) and inner pin holes (1653) are arranged at intervals at the bottoms of the L-shaped pressing plate main bodies (1651); the inner pin holes (1653) are matched with pin shaft bolts (166); and locking lugs (1654) are arranged at the upper ends of the L-shaped pressing plate main bodies (1651) along a horizontal plane in an outward extending manner.

7. The module pre-installed offshore booster station according to claim 3, wherein the stud shaft (168) comprises a pin rod (1681), a thread stud (1682) and an outer hexagonal part (1683) that are coaxially arranged in sequence; and the pin rod (1681), the thread stud (1682) and the outer hexagonal part (1683) are of an integral structure.

Patentansprüche

1. Modulvormontierte Offshore-Boosterstation, umfassend eine Stützbasis (1), eine auf der Stützbasis (1) angebrachte Boosterstation-Plattform (2) und an der Boosterstation-Plattform (2) vormontierte Module, dadurch gekennzeichnet, dass die vormontierten Module ein Haupttransformatormodul (3), ein GIS-Baugruppenmodul (4), ein Dieselgeneratormodul (5), ein Batteriemodul (6), ein Niederspannungs-Stromverteilungsmodul (7), ein Niederspannungs-Kommunikationsmodul (8), ein sekundäres Gerätemodul (9) und ein elektrisches Stationsgerätemodul (10) umfasst, wobei zwei Seiten der vormontierten Module jeweils oben mit einer Vorfeldplattform (11) und einer Kranplattform (12) versehen sind, und an der Kranplattform (12) ein Hebekran (13) vorgesehen ist;
dass die vormontierten Module jeweils in den Containerkörpern der vorgefertigten, unabhängig voneinander vorgefertigten Container (14) angeordnet sind, der Oberteil und die unteren vier Ecken des vorgefertigten Containers (14) mit Containereckstücken (15) versehen sind;
dass ein selbsthemmender Montagesitz (16) positionsfest auf der Boosterstation-Plattform (2) angeordnet ist, die mit dem unteren Containereckstück (15) jedes vorgefertigten Containers (14) korrespondiert.

2. Modulvormontierte Offshore-Boosterstation nach Anspruch 1, dadurch gekennzeichnet, dass der vorgefertigte Container (14) mit einer beweglichen Tür versehen ist, im Containerkörper des vorgefertigten Containers (14) ferner eine Innenbeleuchtung, eine Innendekoration, ein Heizungs-Lüftungsgerät und eine Klimaanlage vorgesehen sind.

3. Modulvormontierte Offshore-Boosterstation nach Anspruch 1, dadurch gekennzeichnet, dass der selbsthemmende Montagesitz (16) eine Quadratschalenbasis (161) mit einer offenen Oberseite umfasst, eine Auslösehülse (162) in der Mitte des inneren Hohlraums der Quadratschalenbasis (161) vorgesehen ist, wobei der Boden des inneren Hohlraums der Auslösehülse (162) beweglich mit dem Boden der Quadratschalenbasis (161) verbunden ist, indem eine feste Gleitsäule (163)durchdringend vorgesehen ist, außerhalb zwei benachbarter Seiten der Auslösehülse (162) Gleitnutennasen (164) fest vorgesehen sind, die Quadratschalenbasis (161) und die Gleitnutennasen (164) an zwei entsprechenden Seiten gelenkig mit selbsthemmenden Druckplatten (165) versehen sind die Außenseite der selbsthemmenden Druckplatten (165) über eine Bolzenwelle (168) gelenkig mit der Seitenwand der Quadratschalenbasis (161) verbunden ist, das Innenseitenende der selbsthemmenden Druckplatten (165) über einen Stiftwellenbolzen (166) gelenkig mit den Gleitnutnasen (164) verbunden ist, der Oberteil der Innenwand der selbsthemmenden Druckplatte (165) mit einem an das Nutloch der Containereckstücken (15) angepassten selbsthemmenden Vorsprung (167) versehen ist.

4. Modulvormontierte Offshore-Boosterstation nach Anspruch 3, dadurch gekennzeichnet, dass eine Rückstelldruckfeder (169) an der Außenwand der festen Gleitsäule (163) aufgesetzt ist, wobei die Rückstelldruckfeder (169) zwischen dem Boden der Auslösehülse (162) und der Quadratschalenbasis (161) anliegt.

5. Modulvormontierte Offshore-Boosterstation nach Anspruch 3, dadurch gekennzeichnet, dass die Quadratschalenbasis (161) durch Schweißen einer quadratischen Bodenplatte (1611) und einer quadratischen Umgebungswand (1612) gebildet ist, wobei die quadratische Bodenplatte (1611) fest mit der Oberseite der Boosterstation-Plattform (2) verschweißt ist, und Verstärkungsrippen (1613) zwischen den peripheren Außenwänden der quadratischen Umgebungswand (1612) und der Oberseite der quadratischen Bodenplatte (1611) geschweißt vorgesehen sind.

6. Modulvormontierte Offshore-Boosterstation nach Anspruch 3, dadurch gekennzeichnet, dass die selbsthemmende Druckplatte (165) zwei Druckplatten, die sich gegenseitig spiegeln, umfasst, wobei die selbsthemmende Druckplatte (165) einen L-förmigen Druckplattenhauptkörper (1651) umfasst, die Innenseite des oberen Endes des L-förmigen Druckplattenhauptkörpers (1651) mit dem selbsthemmenden Vorsprung (167) versehen ist, ein äußeres Stiftloch (1652) und ein inneres Stiftloch (1653) voneinander beabstandet am Boden des Druckplattenhauptkörpers (1651) angeordnet sind, wobei das innere Stiftloch (1653) an den Stiftwellenbolzen (166) angepasst ist, und sich das obere Ende des L-förmigen Druckplattenhauptkörpers (1651) entlang der horizontalen Ebene nach außen erstreckt und mit einer Verriegelungsnase (1654) versehen ist.

7. Modulvormontierte Offshore-Boosterstation nach Anspruch 3, dadurch gekennzeichnet, dass die Bolzenwelle (168) eine Stiftstange (1681), eine Gewindesäule (1682), einen Außensechskantabschnitt (1683), die koaxial nacheinander angeordnet sind, umfasst, wobei die Stiftstange (1681), die Gewindesäule (1682) und der Außensechskantabschnitt (1683) als integrale Struktur ausgelegt sind.

DRAWINGS OF DESCRIPTION

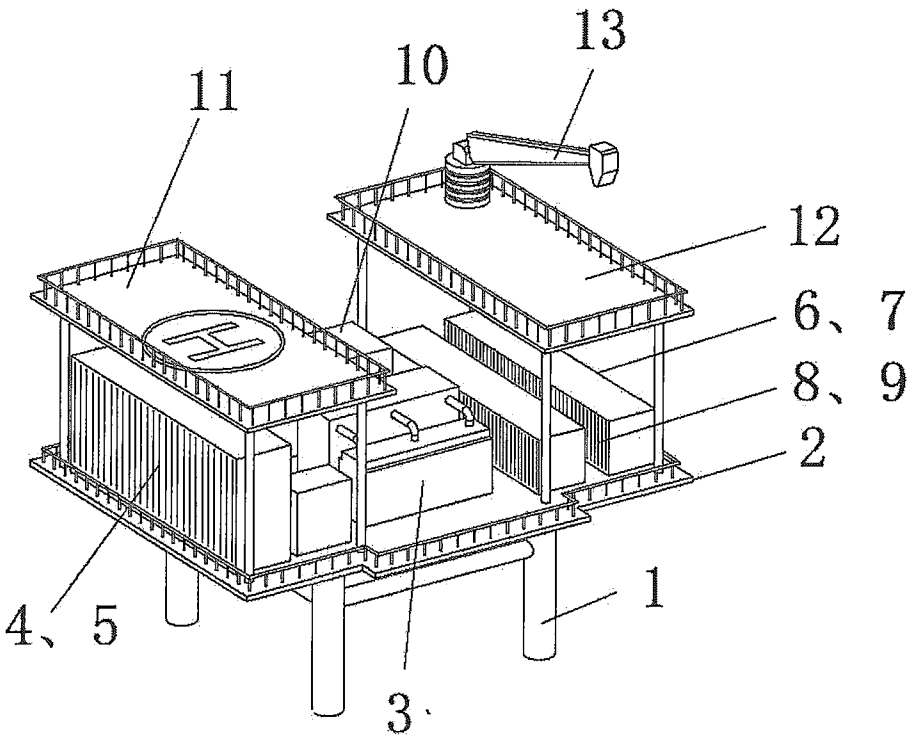

FIG. 1

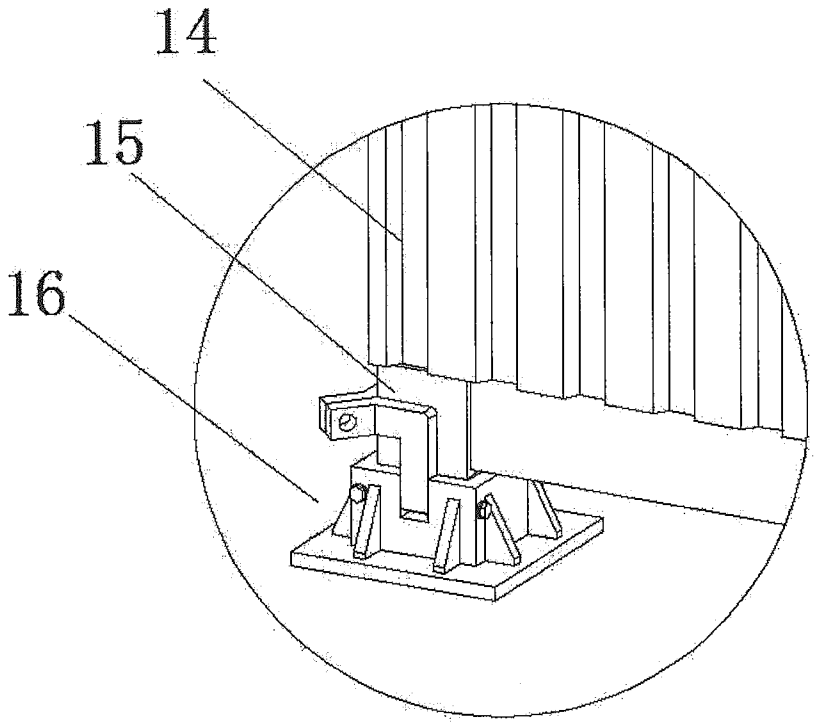

FIG. 2

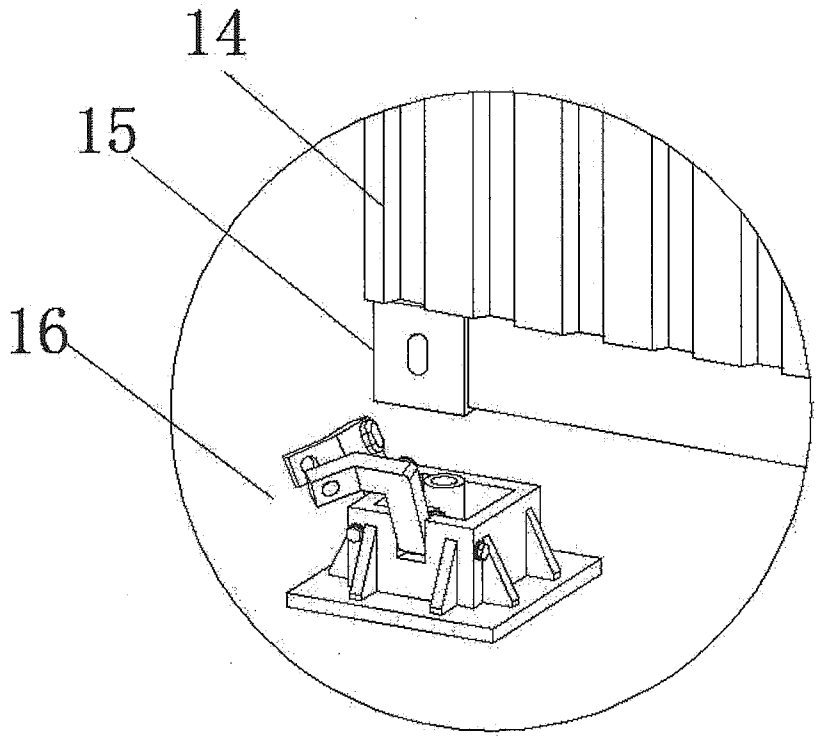

FIG. 3

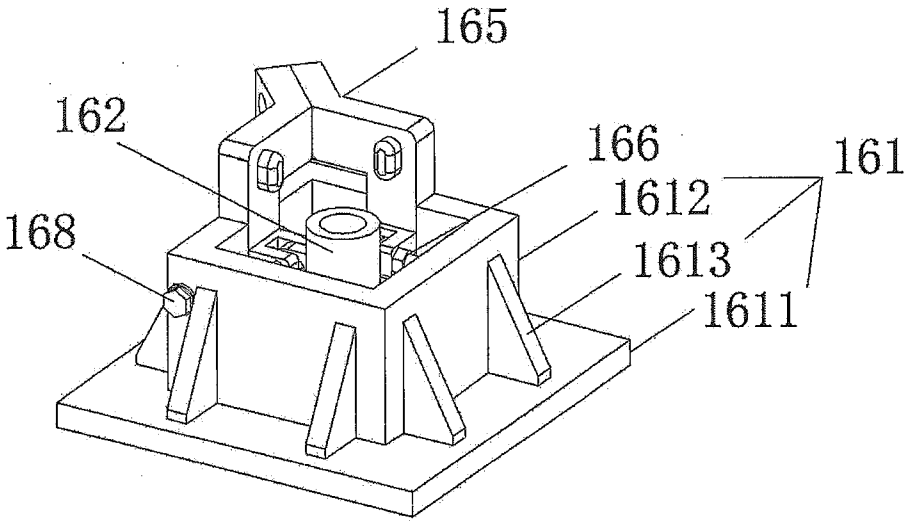

FIG. 4

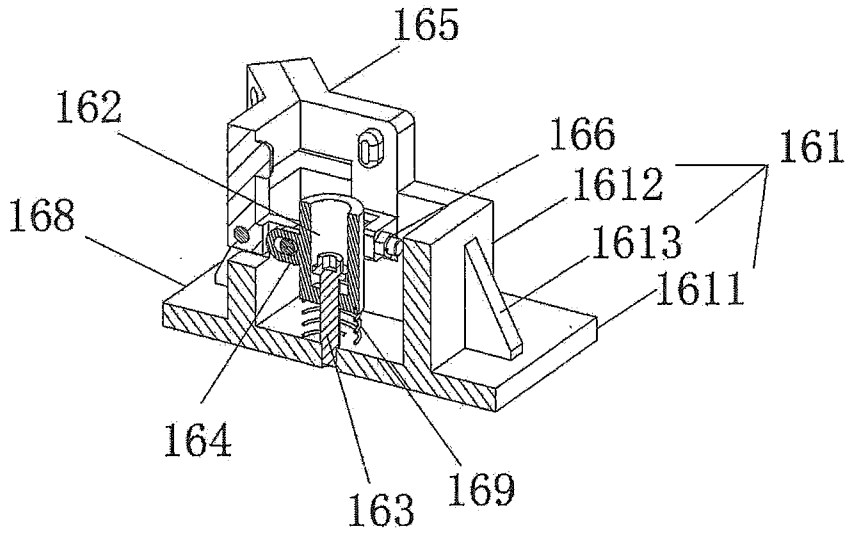
165
162
166
161
1612
168
1613
1611
164
163
169

FIG. 5

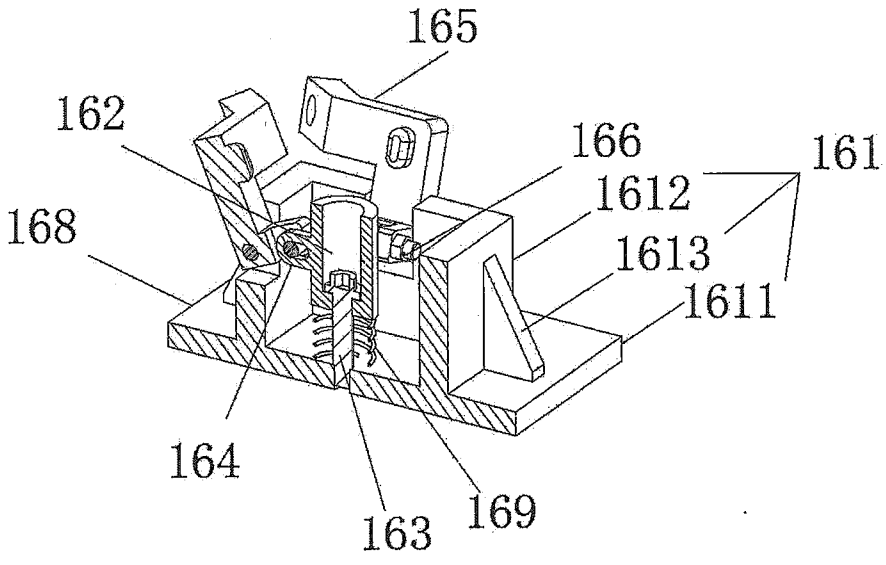
165
162
166
161
1612
168
1613
1611
164
163
169

FIG. 6

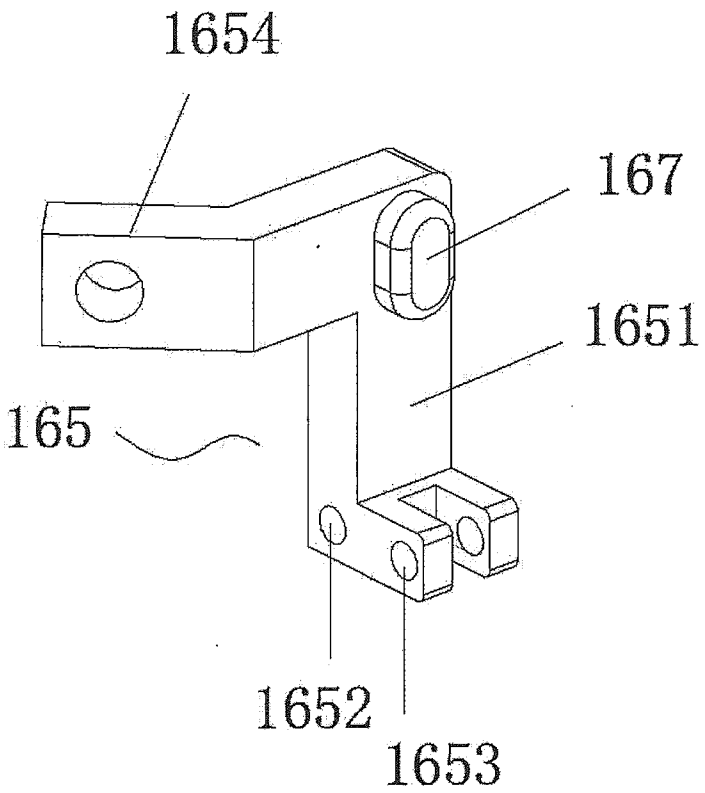

FIG. 7

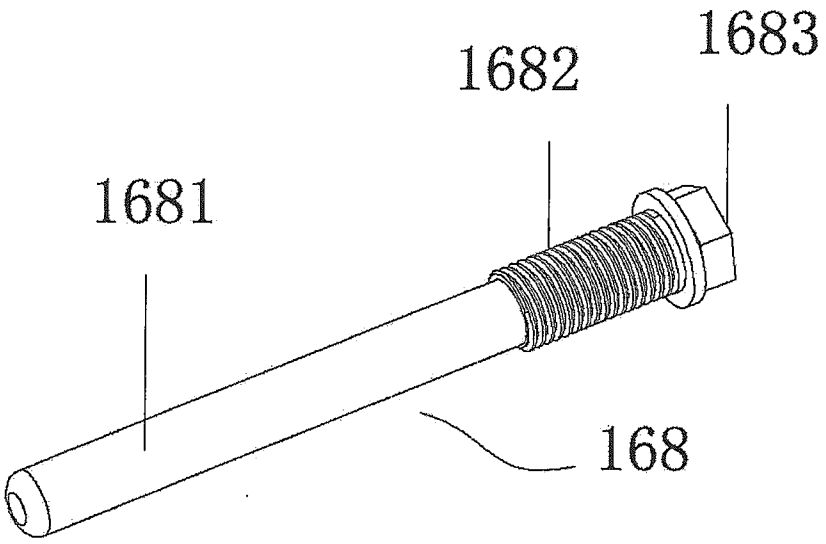

FIG. 8