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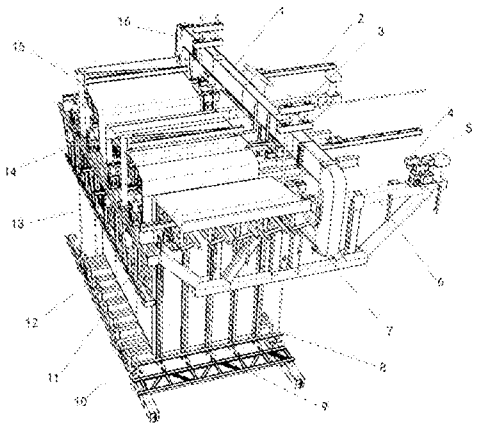
(54) **VARIABLE CROSS-SECTION INTELLIGENT BRIDGE-BUILDING MACHINE.**

(57) A variable cross-section intelligent bridge-building machine, which comprises: a hanging beam, two main beams, an outer mold, two guide rails, and a counter-force mechanism, the hanging beam is arranged on an end face of a poured section of a bridge; the two main beams are detachably fixed to the ends of the C-shaped components, one end of the main beams is extended towards the poured section, and the other end of the main beams is extended out of the end face of the poured section; the outer mold is arranged at a part of the main beams extending out of the end face of the poured section, and an inner portion of the outer mold is correspondingly provided with an inner mold; the two guide rails are correspondingly arranged at both sides of a bridge deck, and both ends of the hanging beam are respectively provided with supporting bases which are assembled inside the guide rails in a sliding manner; the counter-force mechanism is correspondingly arranged at one end of the main beams extending towards the poured section. The variable cross-section intelligent bridge-building machine is arranged on the poured section of the bridge, and the variable cross-section intelligent bridge- building machine is fully supported by means of the hanging beam and the main beams, upon being driven by external force, the hanging beam can slide along the guide rails, thereby implementing automatic movement.



VARIABLE CROSS-SECTION INTELLIGENT BRIDGE-BUILDING MACHINE

Background

Field of the Invention

The present invention relates to the technical field of bridge construction, and in particular to a variable cross-section intelligent bridge-building machine.

Background Information

Cantilever pouring construction refers to the construction method that the concrete beams are poured into the middle of the span symmetrically and evenly by using a special equipment on both sides along the bridge with the center of the pier, and the prestress is applied one by one. The hanging basket bridge-building machine is a special equipment used to bear the self-weight and construction load of the beam body and move forward one by one when pouring the concrete beam body by the cantilever method. The traditional bridge-building machine needs demoulding before advancing in the construction process, which brings lots of inconvenience to the construction and low adjustment efficiency.

Accordingly, there is a need to provide an improved solution to the above-mentioned deficiencies of the prior art.

SUMMARY

It is an object of the present invention to provide a variable cross-section intelligent bridge-building machine to solve the above-mentioned problems in the prior art.

In order to achieve the above-mentioned object, the present invention provides the following technical solutions:

A variable cross-section intelligent bridge-building machine comprises: a hanging beam, two main beams, an outer mold, two guide rails, and a counter-force mechanism,

the hanging beam is arranged on an end face of a poured section of a bridge, and both ends of the hanging beam are provided with C-shaped components, ends of the C-shaped components are folded downwards from both sides of the bridge to below a flange;

the two main beams are detachably fixed to the ends of the C-shaped components, one end of the main beams is extended towards the poured section, and the other end of the main beams is extended out of the end face of the poured section;

the outer mold is arranged at a part of the main beams extending out of the end face of the poured section, and an inner portion of the outer mold is correspondingly provided with an inner mold to

form a pouring formwork corresponding to the end face of the bridge;

the two guide rails are correspondingly arranged at both sides of a bridge deck, and both ends of the hanging beam are respectively provided with supporting bases which are assembled inside the guide rails in a sliding manner;

the counter-force mechanism is correspondingly arranged at one end of the main beams extending towards the poured section, and is pressed tightly against the flange of the bridge longitudinally;

the counter-force mechanism comprises reversal wheels and a reversal member, both of which are connected to the main beams through a self-locking hydro-cylinder;

the reversal member is fixedly connected to a corresponding self-locking hydro-cylinder, an upper surface of the reversal member is an inclined plane corresponding to the flange of the bridge;

two reversal wheels are connected to a same cam groove, and two cam grooves are correspondingly hinged at both sides of a width direction of the bridge corresponding to a wheel box to rotate in a plane of a length direction of the bridge; the wheel box is correspondingly hinged at an upper end of the self-locking hydro-cylinder to rotate in the plane of the width direction of the bridge;

the outer mold comprises a wing mold, a side mold and a bottom mold, one end of the main beams extending out of the poured section is correspondingly connected with an end rack, and a lower of the main beams is correspondingly provided with a side rack, the wing mold and the side mold are correspondingly arranged on the side rack and the main beams;

a lower of the main beams is provided with a hanging basket corresponding to the bottom mold, one side of the hanging basket is connected to the end rack through multiple second anchor rods, and the other side of the hanging basket is connected directly below a connection point of the hanging beam corresponding to the side rack through two second anchor rods;

both sides of the main beams are provided with mold bases corresponding to the wing mold and the side mold, and the main beams are provided with upper portion stop levers which are assembled along the width direction of the bridge in a sliding manner, multiple mold bases are distributed on the upper portion stop levers along the length direction of the main beams;

the main beams are provided with slide rails that extend outward in an opposite direction along the width direction of the bridge, and the mold bases are provided with sliding blocks that are assembled inside the slide rails in a sliding manner, the slide rails are provided with first push rods

that drive upper ends of the mold bases;

the hanging basket is provided with a lower portion stop lever that correspondingly stops lower ends of multiple mold bases, and the lower portion stop lever is provided with second push rods that drive the lower end of each of the mold bases respectively.

Advantageous effects:

The variable cross-section intelligent bridge-building machine is arranged on the poured section of the bridge, and the variable cross-section intelligent bridge-building machine is fully supported by means of the hanging beam and the main beams, upon being driven by external force, the hanging beam can slide along the guide rails, thereby implementing automatic movement. The outer mold is driven by the first push rod and the second push rod, and which can quickly assemble or remove the outer mold under the action of the first push rod and the second push rod, so as to improve the construction efficiency.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a structure diagram of the bridge-building machine;

Fig. 2 is a distribution schematic diagram of the guide rail;

Fig. 3 is a structure diagram of the reversal wheel;

Fig. 4 is a structure diagram of the reversal member;

Fig. 5 is a structure diagram of the hanging beam;

Fig. 6 is a structure diagram of the installation member;

Fig. 7 is a structure diagram of the installation member;

Fig. 8 is an enlarged diagram at position A in Fig. 7;

Fig. 9 is an enlarged diagram at position B in Fig. 7;

Fig. 10 is an enlarged diagram at position C in Fig. 7.

In the drawings: 1-hanging beam; 2-guide rail; 3-first anchor rod; 4-reversal wheel; 5-reversal member; 6-main beam; 7-mold base; 8-lower portion stop lever; 9-second push rod; 10-side mold; 11-wing mold; 12-hanging basket; 13-second anchor rod; 14-end rack; 15-hanging rack; 16-C-shaped component; 17-supporting base; 18-inner mold; 19-anchor rack; 20-self-locking hydro-cylinder; 21-installation member; 22-traction member; 23-second supporting member; 24-first supporting member; 25-sliding block; 26-slide rail; 27-first push rod; 28-supporting rod; 29-cam groove; 30-wheel box; 1901-second anchor nut; 1902-first anchor nut; 2101-hinging station; 2102-

plug hole.

DETAILED DESCRIPTION OF EMBODIMENTS

As shown in Figs. 1-10, A variable cross-section intelligent bridge-building machine comprises: the hanging beam 1, the main beams 6, the outer mold, the guide rails 2, and the counter-force mechanism, the hanging beam 1 is arranged above the bridge, and is arranged on an end face of a poured section of the bridge, serving as the load-bearing component of the entire bridge-building machine, and both ends of the hanging beam 1 are provided with C-shaped components 16, the ends of the C-shaped components 16 are folded downwards from both sides of the bridge to below a flange, thereby the main beams 6, hanging basket 12 and the like are hanged on the ends of C-shaped components 16 below the flange, specifically, the two main beams 6 are detachably fixed to the ends of the C-shaped components 16, one end of the main beams 6 is extended towards the poured section, which is supported on the lower surface of the flange through the counter-force mechanism, and the other end of the main beams 6 is extended out of the end face of the poured section, and is used to connect the hanging basket 12 and the outer mold, the outer mold is arranged at a part of the main beams 6 extending out of the end face of the poured section, and the contour of the inner wall of the outer mold is compatible with the the outer contour of the bridge, thus forming the outer surface of the bridge through pouring; an inner portion of the outer mold is correspondingly provided with an inner mold 18, which forms the inner hole contour of the bridge, so as to form a pouring formwork corresponding to the end face of the bridge through the outer mold and the inner mold 18; the two guide rails 2 are correspondingly arranged at both sides of a bridge deck and are distributed parallel, preferably, the two guide rails 2 are located on both sides of the top plate of the bridge near the flange to bear the weight of the bridge-building machine on the bridge and avoid the excessive stress on the flange, the guide rails 2 are anchored on the bridge deck through anchoring nails and other means, both ends of the hanging beam 1 are respectively provided with supporting bases 17 which are assembled inside the guide rails 2 in a sliding manner, which can make the bridge slide along the guide rails 2 as a whole, thereby driving the overall movement of the bridge-building machine, the counter-force mechanism is correspondingly arranged at one end of the main beams 6 extending towards the poured section, and is pressed tightly against the flange of the bridge longitudinally, so as to maintain the equilibrium state of both ends of the main beams 6 through the reversal of the counter-force mechanism; in this example, a roller is provided below the supporting bases 17, and

a hydraulic rod, a manual hoist or an electric hoist are provided inside the guide rails 2 to drive the supporting bases 17, thereby driving the movement of the bridge-building machine.

The main beams 6 are assembled on the hanging beam 1 through an installation member 21, which is a block-like structure, a middle portion of the installation member 21 is provided with a plug hole 2102 that is compatible with the ends of C-shaped components 16, in this example, the cross-sections of the ends of the C-shaped components 16 are square, at the ends of C-shaped components 16, a smooth transition is made on the lower surfaces of the C-shaped components 16 to reduce the cross-sections of the ends of the C-shaped components 16, the size of the plug hole 2102 can be minimized as much as possible without affecting the strength of the hanging beam 1, and after passing through the plug hole 2102, the ends of C-shaped components 16 approaches the side plate of the bridge; the lower of the installation member 21 is provided with a hinging station 2101 corresponding to the main beams 6, which is a groove-like structure at the bottom of the installation member 21, and the main beams 6 are located at the hinging station 2101 through a hinge shaft, so as to fix the main beams 6 on the hanging beam 1.

Both sides of the installation member 21 are provided with first anchor rods 3, and the lower ends of the two first anchor rods 3 are fixed on both sides of the installation member 21, and the upper ends of the first anchor rods 3 are extended upwards from both sides of the hanging beam 1 after passing through the flange of the bridge, an upper of the hanging beam 1 is provided with a first supporting member 24, and both ends of the first supporting member 24 are detachably connected to two first anchor rods 3 respectively, so that the installation component 21 is applied to the hanging beam 1 through the first anchor rods 3, which ensure that the main beams 6 are subjected to force on the main body of the hanging beam 1 by loading prestress, avoiding the deformation of the C-shaped components 16 under force.

The counter-force mechanism comprises reversal wheels 4 and a reversal member 5, both of which are connected to the main beams 6 through a self-locking hydro-cylinder 20, in the pouring state, the reversal member 5 is pressed tightly against the lower surface of the flange, when movement is needed, the reversal member 5 is retracted, and the reversal wheels 4 is pressed tightly against the lower surface of the flange, so as to form the rolling friction, and the reversal member 5 is fixedly connected to a corresponding self-locking hydro-cylinder 20, an upper surface of the reversal member 5 is an inclined plane corresponding to the flange of the bridge, in the normal state,

it can attach tightly to the lower surface of the flange, which ensures the stability of the reversal. In order to ensure that the reversal wheels 4 is tightly attached to the lower surface of the flange during the movement of the bridge-building machine, the reversal wheels 4 is set to be hinged, specifically, two reversal wheels 4 are connected to a same cam groove 29, which are distributed in the length direction of the bridge, so that they can move along the lower surface of the flange in the length direction of the bridge, and two cam grooves 29 are correspondingly hinged at both sides of a width direction of the bridge corresponding to a wheel box 30 to rotate in a plane of a length direction of the bridge during movement; the wheel box 30 is correspondingly hinged at an upper end of the self-locking hydro-cylinder 20 to rotate in the plane of the width direction of the bridge, so as to form a two-dimensional angle rotation, ensuring that the reversal wheels 4 are tightly attached to the lower surface of the flange during the movement of the bridge-building machine.

The outer mold comprises a wing mold 11, a side mold 10 and a bottom mold, wherein the shape of the wing mold 11 is adapted to the shape of the lower surface of the flange, the side mold 10 is adapted to the shape of the outer wall of the belly plate of the bridge, the bottom mold is connected to the bottom portion of the side mold 10, so as to form a complete outer mold, one end of the main beams 6 extending out of the poured section is correspondingly connected with an end rack 14, which is welded from channel steel or square steel, and has at least two front upper crossbeams connecting the end portions of the main beams 6, the end rack 14 is fixed to the end portions of the main beams 6 through the bolts, and a lower of the main beams 6 is correspondingly provided with a side rack, which is welded from channel steel or square steel, the wing mold 11 and the side mold 10 are correspondingly arranged on the side rack and the main beams 6; the lower of the main beams 6 is provided with a hanging basket 12 corresponding to the bottom mold, which is a square truss composed of the channel steel or the square steel welded together, specifically, it can be welded or bolted together, the bottom mold is correspondingly placed on the hanging basket 12, one side of the hanging basket 12 is connected to the end rack 14 through multiple second anchor rods 13, which can be connected to the front upper crossbeam of the end rack 14, and the other side of the hanging basket 12 is connected directly below a connection point of the hanging beam 1 corresponding to the side rack through two second anchor rods 13, the bottom mold is lifted by the upward traction of the second anchor rods 13 to ensure the connection between the bottom mold and the side mold 10, the wing mold 11.

In order to apply continuous variable cross-section bridge, the second anchor rods 13 can be adjusted according to actual needs for the inclined plane at the bottom of the variable cross-section, so that the hanging basket 12 and the bottom mold can be inclined accordingly for variable cross-section construction.

Both sides of the main beams 6 are provided with mold bases 7 corresponding to the wing mold 11 and the side mold 10, one side of the mold bases 7 corresponding to outer mold is provided with a shape that is compatible with the surface of the side portion of the bridge to support the wing mold 11 and the side mold 10, and the main beams 6 are provided with upper portion stop levers which are assembled along the width direction of the bridge in a sliding manner, multiple mold bases 7 are distributed on the upper portion stop levers along the length direction of the main beams 6;

the main beams 6 are provided with the slide rails 26 that extend outward in an opposite direction along the width direction of the bridge, and the mold bases 7 are provided with the sliding blocks 25 that are assembled inside the slide rails 26 in a sliding manner, the slide rails 26 can be fixed on the outer side of the main beams 6 through the bracket, and the slide rails 26 have at least two, the slide rails 26 are provided with the first push rods 27 that drive the upper ends of the mold bases 7, which can be a hydraulic rod that can drive the mold bases 7 to slide along the slide rails 26, the hanging basket 12 is provided with a lower portion stop lever 8 that correspondingly stops the lower ends of multiple mold bases 7, which is fixed on the hanging basket 12, and the lower portion stop lever 8 is provided with the second push rods 9 that drive the lower end of each of the mold bases 7 respectively, the second push rods 9 can also be a hydraulic rod, the second push rods 9 and the first push rods 27 move synchronously, allowing for quick assembly or removal of outer mold after pouring, after removal, the bridge-building machine can be moved, which is simple and efficient.

A supporting rod 28 is provided between the C-shaped components 16 and the front upper crossbeam of end rack 14, the supporting rod 28 passes through multiple mold bases 7 in sequence, the supporting rod 28 is connected to the C-shaped components 16 and the front upper crossbeam of end rack 14 through the sliding assembly, and is slid along the width direction of the bridge to support a part of the wing mold 11 of mold bases 7.

The upper of the side rack and the upper of the front upper crossbeam are provided with anchor racks 19 corresponding to the second anchor rods 13 respectively, the second anchor rods 13 pass upwards through the anchor racks 19, a part of the second anchor rods 13 located inside the anchor

racks 19 is provided with first anchor nuts 1902, and the first anchor nuts 1902 are correspondingly stopped at a bottom portion of the anchor racks 19, the second anchor rods 13 are constrained by the first anchor nuts 1902, the upper of the anchor racks 19 is provided with a self-locking hydro-cylinder 20, and the second anchor rods 13 are provided with second anchor nuts 1901 corresponding to the upper end of the self-locking hydro-cylinder 20, when in use, the first anchor nuts 1902 are firstly used to tighten the second anchor rods 13, the second anchor rods 13 are limited and pulled upwards through the self-locking hydro-cylinder 20, at this time, the self-locking hydro-cylinder 20 remains locked, and then the first anchor nuts 1902 are tightened downwards, after the first anchor nuts 1902 are subjected to force, the self-locking hydro-cylinder 20 is retracted and the second anchor nuts 1901 are tightened downwards, repeat this operation to achieve the lifting of the hanging basket 12, when the hanging basket 12 is lowered, the opposite operation is performed.

The C-shaped components 16 are fixed at both ends of the hanging beam 1 through a bolt, and a part of the C-shaped components 16 located on an outer side of the flange of the bridge is provided with traction members 22, which correspondingly draw both sides of the C-shaped components 16. The stability of the C-shaped components 16 is maintained through a traction members 22, specifically, the ear plates are provided on both sides of the C-shaped components 16, and the traction members 22 can be a screw, and both ends of the screw correspondingly pass through two ear plates located on the upper and lower opposite sides of the C-shaped components 16, and then they are fixed by corresponding connecting nut.

A part of the first anchor rods 3 that pass upwards through the first supporting member 24 is correspondingly assembled with third anchor nuts, an upper of the first supporting member 24 is provided with a second supporting member 23, a part of the first anchor rods 3 that extend upwards from the second supporting member 23 is assembled with fourth anchor nuts, and the self-locking hydro-cylinder 20 is provided between the first supporting member 24 and the second supporting member 23. By using the self-locking hydro-cylinder 20 for lifting, the main beams 6 can be preloaded with force, so that the overall force is applied to the hanging beam 1 through the first anchor rods 3. Firstly, by using the self-locking hydro-cylinder 20 for lifting, the third anchor nuts are rotated to transfer the stress to the first supporting member 24 through the third anchor nuts after lifting.

The middle portion of the inner mold 18 is provided with a suspension rod, one end of the

suspension rod is detachably fixed on the end rack 14, the other end of the suspension rod is extended into an inner cavity of the poured section, and is fixed on a top surface of the poured section through an anchor member. The suspension rod is an I-shaped steel, a supporting wheel supported on the side portion of the I-shaped steel is provided inside the inner mold 18, after the pouring is completed, the bridge-building machine is firstly moved, and after the bridge-building machine is moved to the next section to be poured, the suspension rod is erected between the end rack 14 and the poured section, and the inner mold 18 is slid along the suspension rod, so that it is unnecessary to completely remove the inner mold 18.

The end rack 14 is provided with at least one hanging rack 15, the hanging rack 15 is provided with a lifting arm extending above the outer mold, the lifting arm is provided with an electric hoist to lift materials. The hanging beam 1 is provided with a sprinkler system extending above the outer mold, the sprinkler system is correspondingly connected to the water source, which can automatically spray and maintain after the pouring is completed;

the hanging beam 1 is provided with a controller, and the first push rod 27, the second push rod 9 and the sprinkler system are correspondingly connected to the controller, which can automate the movement of the bridge-building machine.

CLAIMS

1. A variable cross-section intelligent bridge-building machine, wherein the variable cross-section intelligent bridge-building machine comprises: a hanging beam, two main beams, an outer mold, two guide rails, and a counter-force mechanism,

the hanging beam is arranged on an end face of a poured section of a bridge, and both ends of the hanging beam are provided with C-shaped components, ends of the C-shaped components are folded downwards from both sides of the bridge to below a flange;

the two main beams are detachably fixed to the ends of the C-shaped components, one end of the main beams is extended towards the poured section, and the other end of the main beams is extended out of the end face of the poured section;

the outer mold is arranged at a part of the main beams extending out of the end face of the poured section, and an inner portion of the outer mold is correspondingly provided with an inner mold to form a pouring formwork corresponding to the end face of the bridge;

the two guide rails are correspondingly arranged at both sides of a bridge deck, and both ends of the hanging beam are respectively provided with supporting bases which are assembled inside the guide rails in a sliding manner;

the counter-force mechanism is correspondingly arranged at one end of the main beams extending towards the poured section, and is pressed tightly against the flange of the bridge longitudinally;

the counter-force mechanism comprises reversal wheels and a reversal member, both of which are connected to the main beams through a self-locking hydro-cylinder;

the reversal member is fixedly connected to a corresponding self-locking hydro-cylinder, an upper surface of the reversal member is an inclined plane corresponding to the flange of the bridge;

two reversal wheels are connected to a same cam groove, and two cam grooves are correspondingly hinged at both sides of a width direction of the bridge corresponding to a wheel box to rotate in a plane of a length direction of the bridge; the wheel box is correspondingly hinged at an upper end of the self-locking hydro-cylinder to rotate in the plane of the width direction of the bridge;

the outer mold comprises a wing mold, a side mold and a bottom mold, one end of the main beams extending out of the poured section is correspondingly connected with an end rack, and a lower of the main beams is correspondingly provided with a side rack, the wing mold and the side mold are

correspondingly arranged on the side rack and the main beams;

a lower of the main beams is provided with a hanging basket corresponding to the bottom mold, one side of the hanging basket is connected to the end rack through multiple second anchor rods, and the other side of the hanging basket is connected directly below a connection point of the hanging beam corresponding to the side rack through two second anchor rods;

both sides of the main beams are provided with mold bases corresponding to the wing mold and the side mold, and the main beams are provided with upper portion stop levers which are assembled along the width direction of the bridge in a sliding manner, multiple mold bases are distributed on the upper portion stop levers along the length direction of the main beams;

the main beams are provided with slide rails that extend outward in an opposite direction along the width direction of the bridge, and the mold bases are provided with sliding blocks that are assembled inside the slide rails in a sliding manner, the slide rails are provided with first push rods that drive upper ends of the mold bases;

the hanging basket is provided with a lower portion stop lever that correspondingly stops lower ends of multiple mold bases, and the lower portion stop lever is provided with second push rods that drive the lower end of each of the mold bases respectively.

2. The variable cross-section intelligent bridge-building machine according to claim 1, wherein the main beams are assembled on the hanging beam through an installation member;

a middle portion of the installation member is provided with a plug hole that is compatible with the ends of C-shaped components, and the lower of the installation member is provided with a hinging station corresponding to the main beams, and the main beams are located at the hinging station through a hinge shaft.

3. The variable cross-section intelligent bridge-building machine according to claim 2, wherein both sides of the installation member are provided with first anchor rods, and the first anchor rods are respectively extended upwards from both sides of the hanging beam after passing through the flange of the bridge, an upper of the hanging beam is provided with a first supporting member, and both ends of the first supporting member are detachably connected to two first anchor rods respectively.

4. The variable cross-section intelligent bridge-building machine according to claim 1, wherein the upper of the side rack and the upper of the end rack are provided with anchor racks corresponding to the second anchor rods respectively, a part of the second anchor rods located inside the anchor racks is provided with first anchor nuts, and the first anchor nuts are correspondingly stopped at a bottom portion of the anchor racks, the upper of the anchor racks is provided with a self-locking hydro-cylinder, and the second anchor rods are provided with second anchor nuts corresponding to the upper end of the self-locking hydro-cylinder.

5. The variable cross-section intelligent bridge-building machine according to claim 1, wherein the C-shaped components are fixed at both ends of the hanging beam through a bolt, and a part of the C-shaped components located on an outer side of the flange of the bridge is provided with traction members, which correspondingly draw both sides of the C-shaped components.

6. The variable cross-section intelligent bridge-building machine according to claim 3, wherein a part of the first anchor rods that pass upwards through the first supporting member is correspondingly assembled with third anchor nuts, an upper of the first supporting member is provided with a second supporting member, a part of the first anchor rods that extend upwards from the second supporting member is assembled with fourth anchor nuts, and the self-locking hydro-cylinder is provided between the first supporting member and the second supporting member.

7. The variable cross-section intelligent bridge-building machine according to claim 1, wherein a middle portion of the inner mold is provided with a suspension rod, one end of the suspension rod is detachably fixed on the end rack, the other end of the suspension rod is extended into an inner cavity of the poured section, and is fixed on a top surface of the poured section through an anchor member.

Ansprüche

1. Intelligenter Brückenbauer mit variablem Querschnitt, dadurch gekennzeichnet, dass er umfasst:

einen Hängebalken, wobei der Hängebalken an der Stirnseite des gegossenen Abschnitts der Brücke angeordnet ist, wobei die beiden Enden des Hängebalkens mit C-förmigen Teilen versehen sind, wobei die Enden der C-förmigen Teile von den beiden Seiten der Brücke nach unten bis unter die Flügelplatten zurückgefaltet sind;

Hauptbalken, wobei zwei Hauptbalken abnehmbar am Ende des C-förmigen Teils befestigt sind, wobei sich ein Ende der Hauptbalkens bis zum gegossenen Abschnitt erstreckt und das andere Ende aus der Endfläche des gegossenen Abschnitts herausragt;

eine Außenform, wobei die Außenform an einem Teil des Hauptbalkens vorgesehen ist, der aus der Endfläche des gegossenen Abschnitts herausragt, und wobei innerhalb der Außenform eine Innenform vorgesehen ist, um eine der Endfläche der Brücke entsprechende Gießschalung zu bilden;

Führungsschienen, wobei die beiden Führungsschienen auf beiden Seiten des Brückendecks entsprechend angeordnet sind und die beiden Enden des Hängebalkens jeweils mit Stützsitzen versehen sind, die verschiebbar in den Führungsschienen montiert sind;

ein Gegenkraftmechanismus, wobei der Gegenkraftmechanismus entsprechend einem Ende des Hauptbalkens angeordnet ist, der sich bis zum gegossenen Abschnitt erstreckt, und in Längsrichtung gegen die Flügelplatte der Brücke drückt;

wobei der Gegenkraftmechanismus ein Gegenkraftrad und einen Gegenkraftglied umfasst, wobei sowohl das Gegenkraftrad als auch das Gegenkraftglied mit dem Hauptbalken durch einen selbsthemmenden Zylinder verbunden sind;

wobei der Gegenkraftglied fest mit einem entsprechenden selbstsichernden Zylinder verbunden ist, dessen Oberseite eine schräge Fläche ist, die einer Flügelplatte des Brückens entspricht;

wobei zwei Gegenkraftnräder mit derselben Radnut verbunden sind, wobei die beiden Radnuten entsprechend auf beiden Seiten des Radkastens angelenkt sind, die der Brückenbreitrichtung entsprechen, um sich in der Ebene zu drehen, in der die Brückenlängsrichtung liegt, und der Radkasten entsprechend am oberen Ende des selbstsperrenden Zylinders angelenkt ist, um sich in der Ebene zu drehen, in der die Brückenbreitrichtung liegt;

wobei die Außenform eine Flügelform, eine Seitenform und eine Bodenform umfasst, wobei ein Ende des Hauptbalkens, das aus der Endfläche des gegossenen Abschnitts herausragt, entsprechend mit einem Endrahmen verbunden ist, wobei ein Seitenrahmen entsprechend unter dem Hauptbalken vorgesehen ist und wobei die Flügelform und die Seitenform entsprechend an dem Seitenrahmen und dem Hauptbalken vorgesehen sind;

wobei unter dem Hauptbalken ein der Bodenform entsprechender Hängekorb

vorgesehen ist, wobei Eine Seite des Hängekorbs über mehrere zweite Ankerstangen mit dem Endrahmen verbunden ist und die andere Seite über zwei zweite Ankerstangen, die den Befestigungspunkten der direkt darunter liegenden Hängebalken entsprechen, mit dem Seitenrahmen verbunden ist;

wobei der Hauptbalken auf beiden Seiten mit Formhaltern versehen ist, die den Flügelformen und den Seitenformen entsprechen, und auf dem Hauptbalken ein oberer Sperrbalken vorgesehen ist, der in Brückenbreitrichtung verschiebbar montiert ist, und wobei eine Vielzahl der Formhalter über die Länge des Hauptbalkens auf dem oberen Sperrbalken verteilt sind;

wobei der Hauptbalken mit einem Schlitten versehen ist, der sich in umgekehrter Richtung in Brückenbreitrichtung nach außen erstreckt, wobei der Formrahmen mit einem Schieber versehen ist, der gleitend in dem Schlitten montiert ist, und wobei der Schlitten mit einem ersten Stellantrieb versehen ist, der das obere Ende des Formrahmens antreibt; und

wobei der Hängekorb mit einem unteren Schalthebel versehen ist, der dem unteren Ende der Vielzahl von Formrahmen entspricht, wobei der untere Schalthebel mit einer zweiten Schubstange versehen ist, um das untere Ende jedes Formrahmens anzutreiben.

2. Intelligenter Brückenbauer mit variablem Querschnitt nach Anspruch 1, dadurch gekennzeichnet, dass der Hauptbalken mit dem Hängebaken durch ein Montageelement verbunden ist;

wobei das Montageelement in der Mitte mit einem Einführungsloch versehen ist, das an das Ende des C-förmigen Teils angepasst ist, und wobei das Montageelement unten mit einer Gelenkstation versehen ist, die dem Hauptträger entspricht, der sich mittels einer Gelenkachse an der Gelenkstation befindet.

3. Intelligenter Brückenbauer mit variablem Querschnitt nach Anspruch 2, dadurch gekennzeichnet, dass das Montageelement auf beiden Seiten mit ersten Ankern versehen ist, wobei sich die ersten Ankerstange von beiden Seiten des Hängebalkens nach oben erstrecken, nachdem sie jeweils durch die Brückenflügelplatte nach oben hindurchgegangen sind, und wobei ein erstes Stützelement oben auf dem Hängebalken vorgesehen ist, und wobei zwei der ersten Ankerstange mit jedem Ende des ersten Stützelements durch entfernbare Mittel verbunden sind.

4. Intelligenter Brückenbauer mit variablem Querschnitt nach Anspruch 1, dadurch gekennzeichnet, dass oberhalb des Seitenrahmens und des Endrahmens jeweils eine Ankerhalterung vorgesehen ist, die der zweiten Ankerstange entspricht, wobei der Teil der zweiten Ankerstange, der sich innerhalb der Ankerhalterung befindet, mit einer ersten Ankermutter versehen ist, wobei die erste Ankermutter entsprechend am Boden des Ankerrahmens blockiert, der Ankerrahmen mit einem selbstsichernden Zylinder oberhalb des Ankerrahmens versehen ist, und die zweite Ankerstange mit einer zweiten Ankermutter versehen ist, die dem oberen Ende des selbstsichernden Zylinders entspricht.

5. Intelligenter Brückenbauer mit variablem Querschnitt nach Anspruch 1, dadurch gekennzeichnet, dass die C-förmigen Teile mit den Enden der Hängebalken verschraubt sind, und der Teil der C-förmigen Teile, der sich an der Außenseite der Brückenflügel befindet, mit Zugelementen versehen ist, wobei die Zugelemente den beiden Seiten des C-förmigen Teils entsprechen.

6. Intelligenter Brückenbauer mit variablem Querschnitt nach Anspruch 3, dadurch gekennzeichnet, dass der Abschnitt der ersten Ankerstange, der nach oben durch das erste Stützelement verläuft, mit einer entsprechenden dritten Ankermutter versehen ist, wobei das erste Stützelement mit einem zweiten Stützelement über dem ersten Stützelement versehen ist, wobei der Abschnitt der ersten Ankerstange, der nach oben aus dem zweiten Stützelement herausragt, mit einer vierten Ankermutter versehen ist, und wobei ein selbstsichernder Zylinder zwischen dem ersten und dem zweiten Stützelement vorgesehen ist.

7. Intelligenter Brückenbauer mit variablem Querschnitt nach Anspruch 1, dadurch gekennzeichnet, dass in der Mitte der Innenform ein Ausleger vorgesehen ist, wobei ein Ende des Auslegers mittels einer abnehmbaren Einrichtung an dem Endrahmen befestigt ist und das andere Ende sich in den inneren Hohlraum des gegossenen Abschnitts erstreckt und mittels eines Verankerungselements an der Oberseite des gegossenen Abschnitts befestigt ist.

1/10

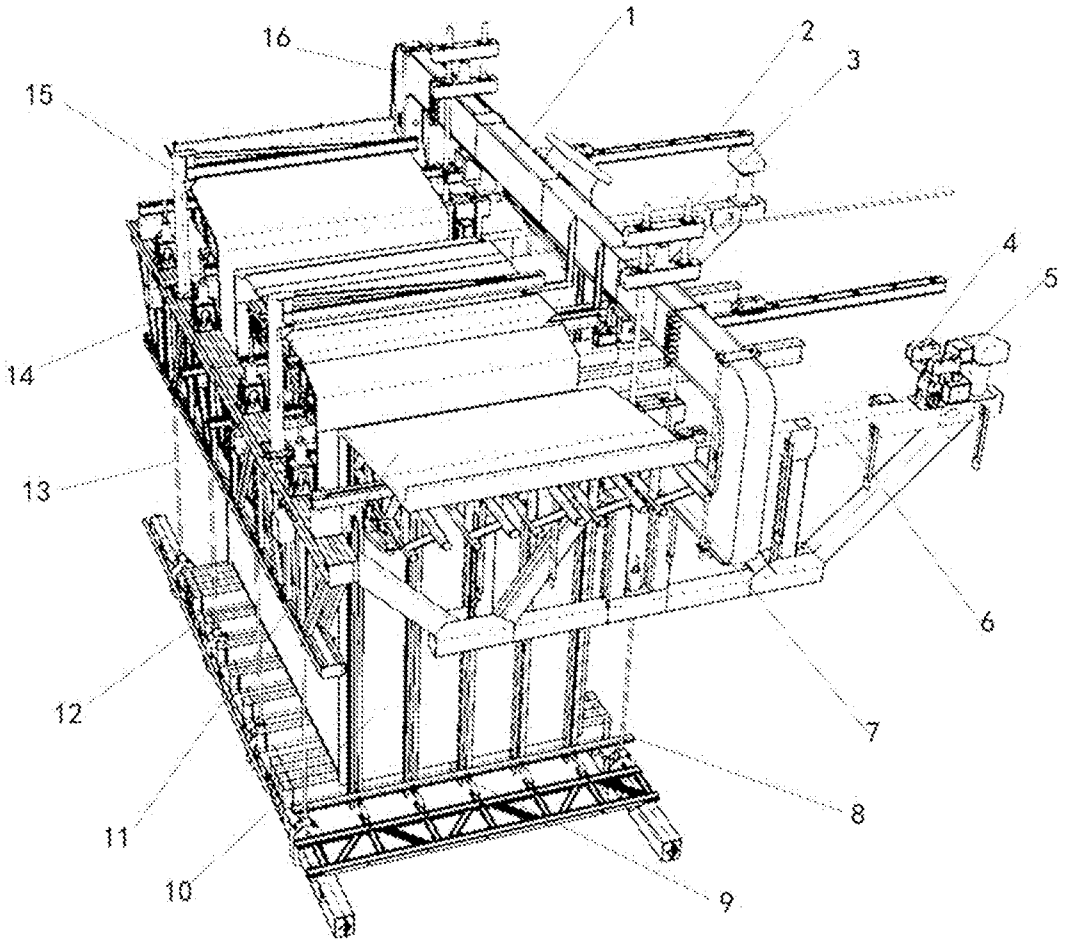


Fig. 1

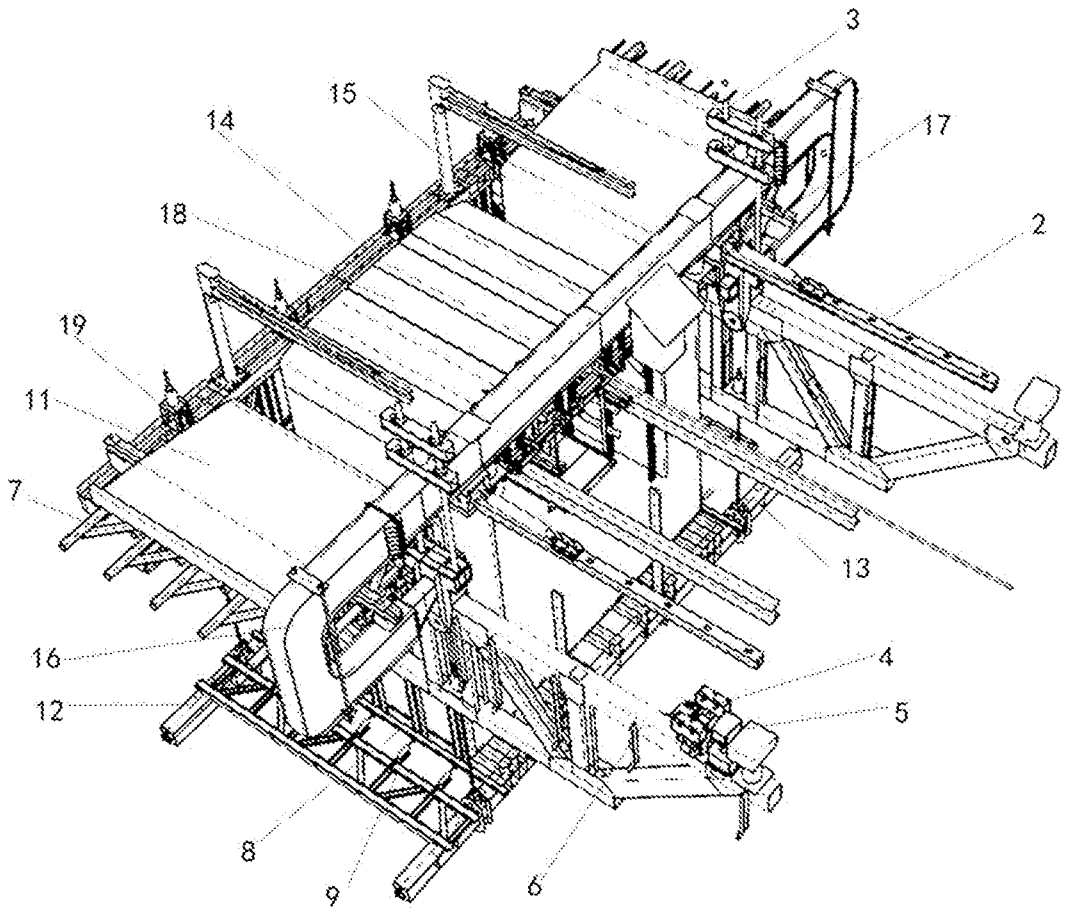


Fig. 2

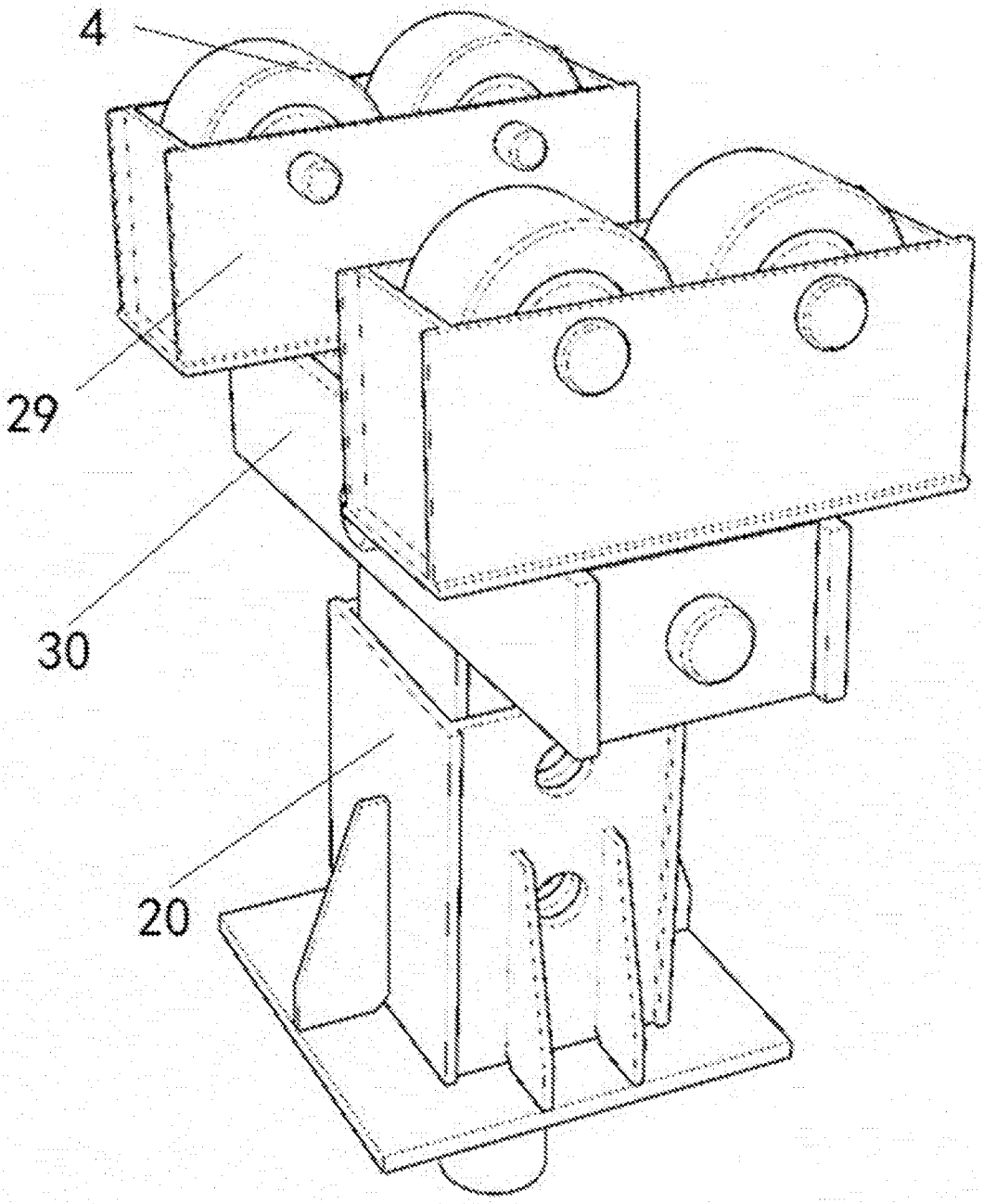


Fig. 3

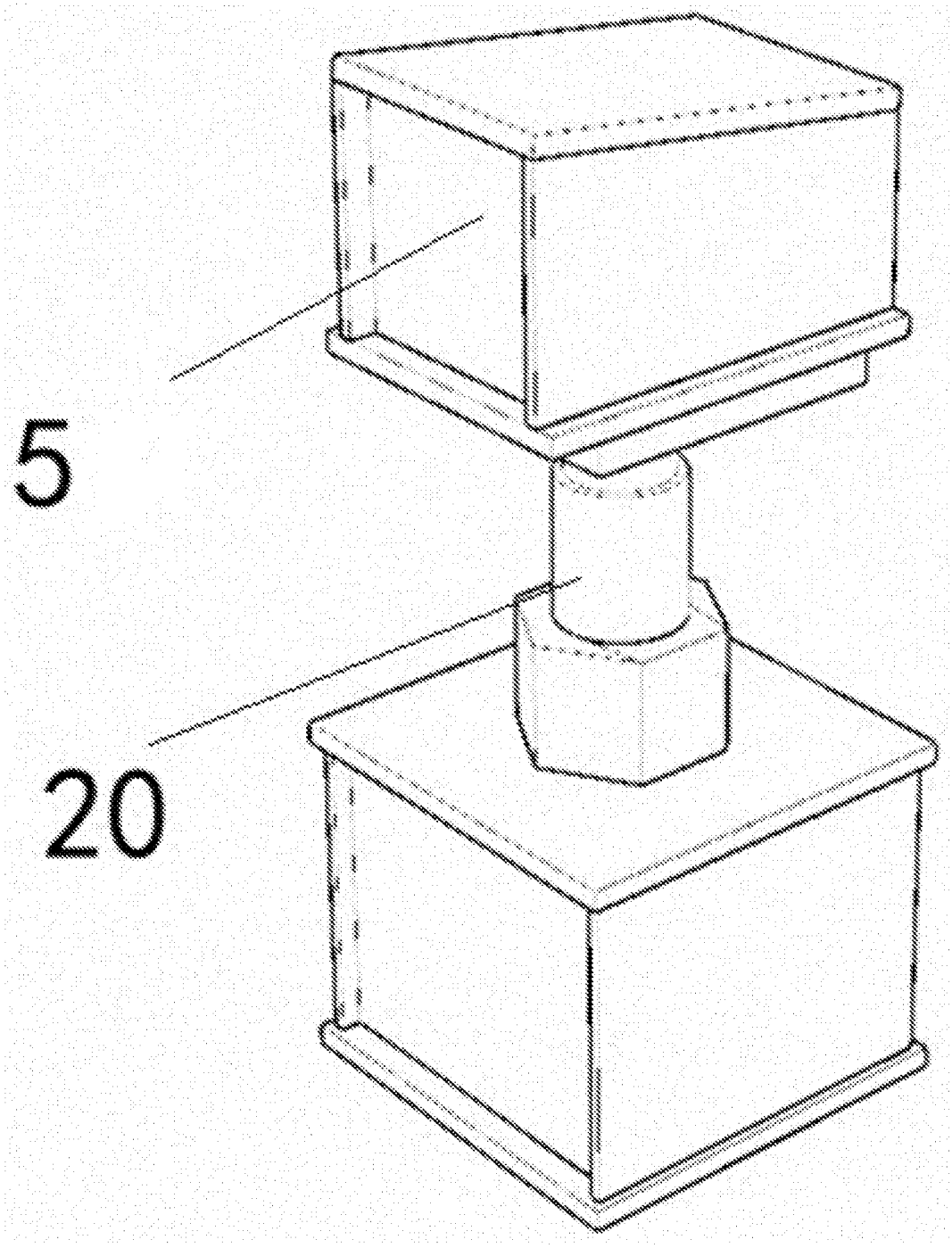


Fig. 4

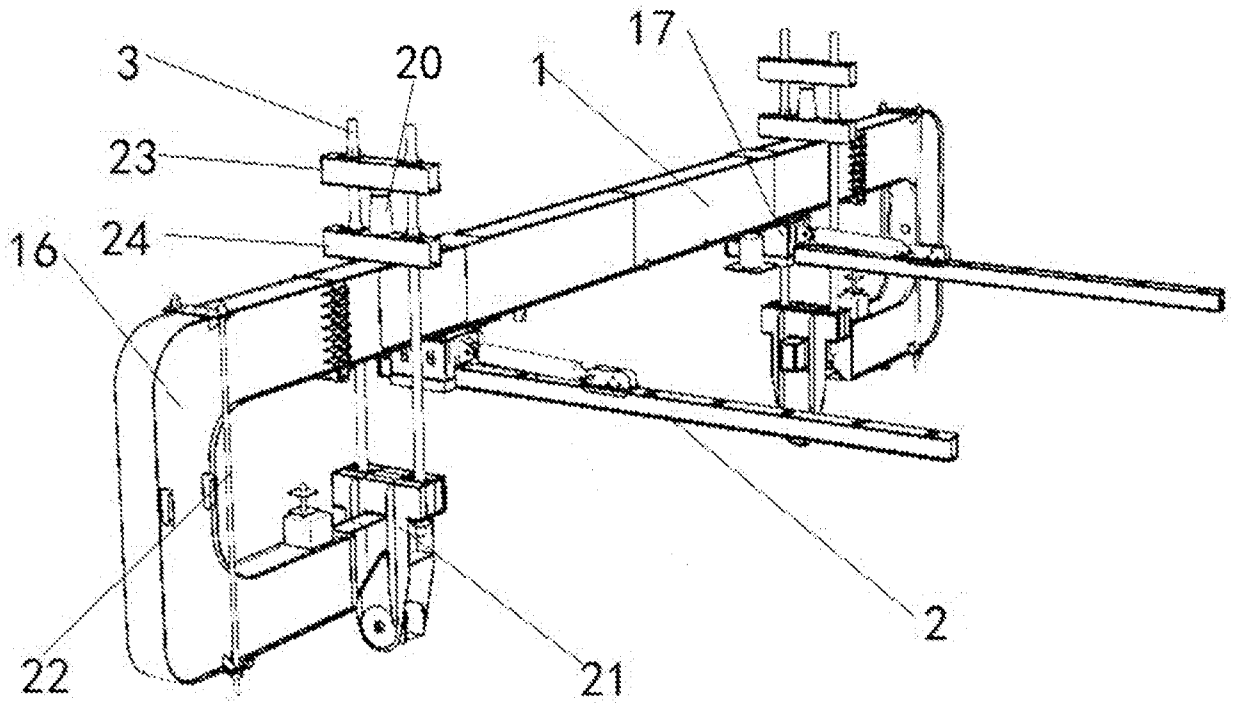


Fig. 5

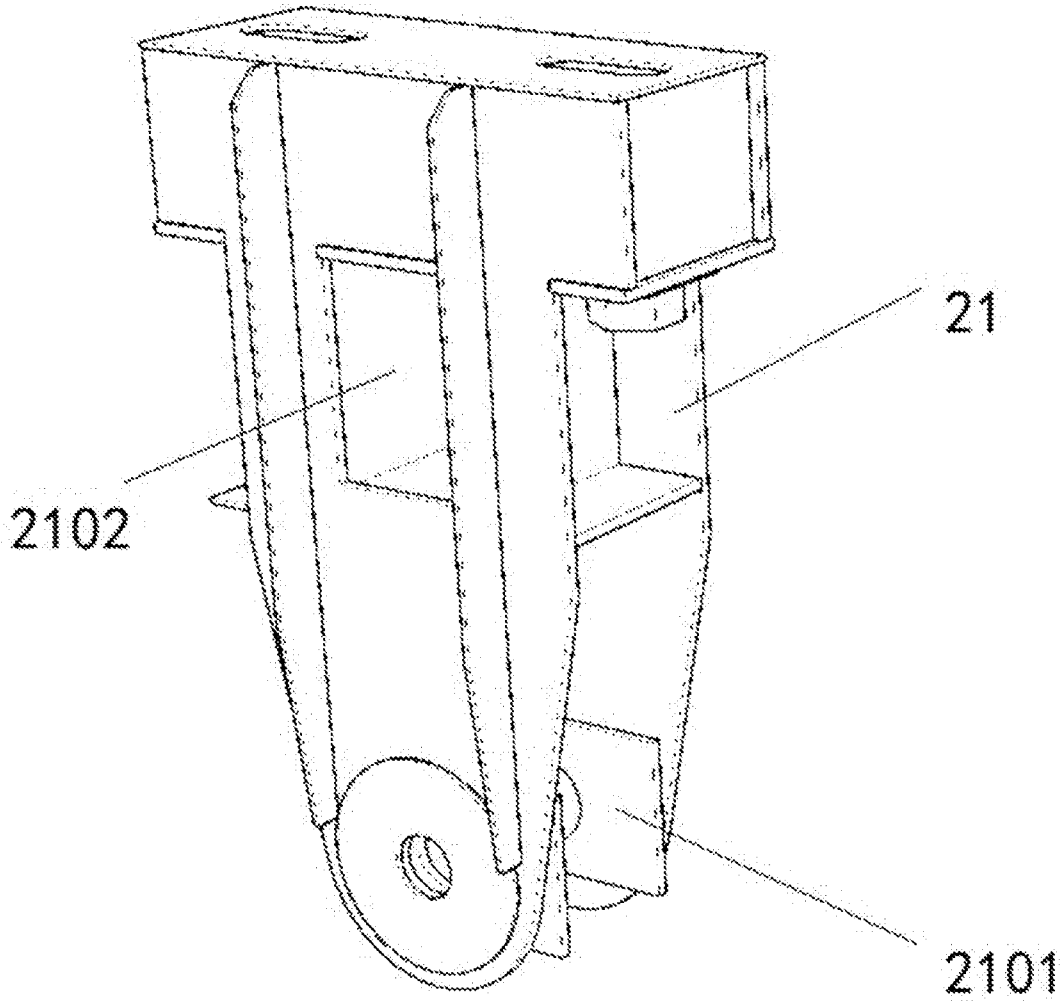


Fig. 6

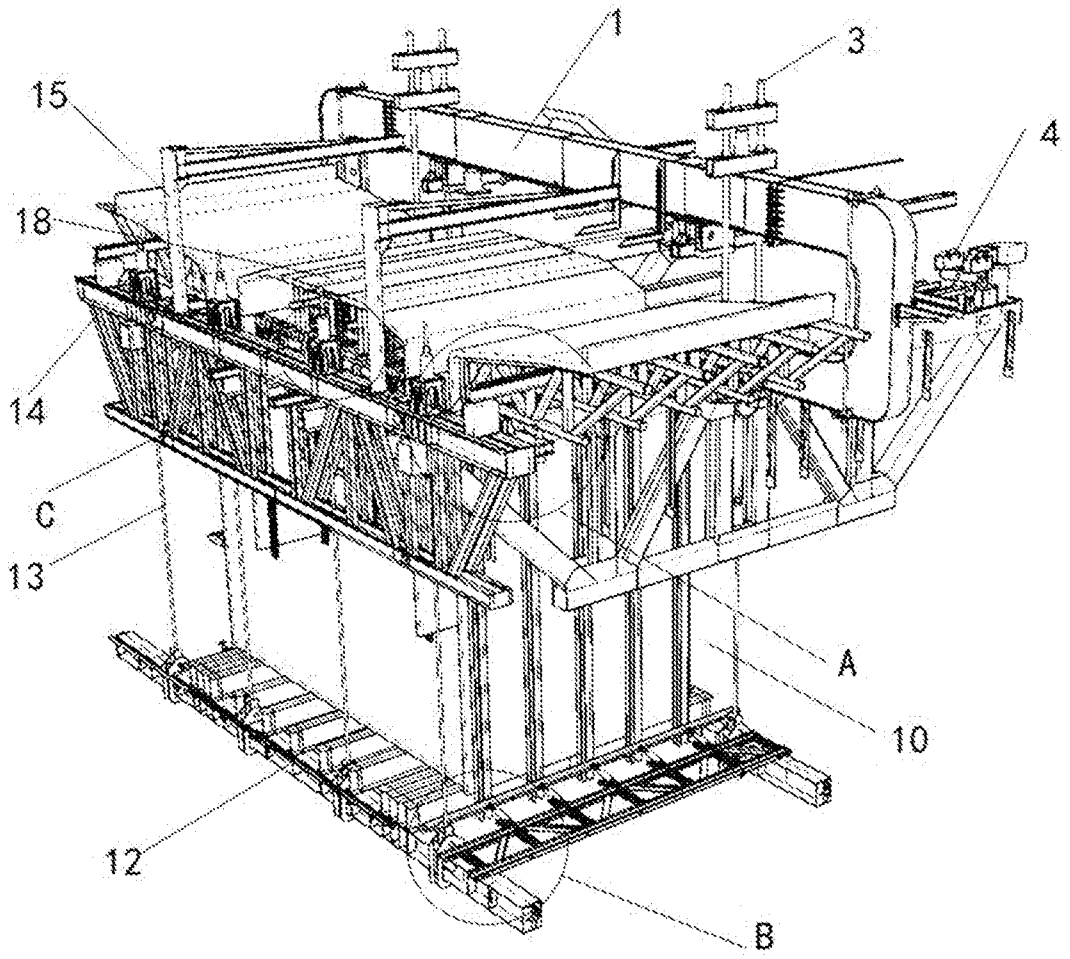


Fig. 7

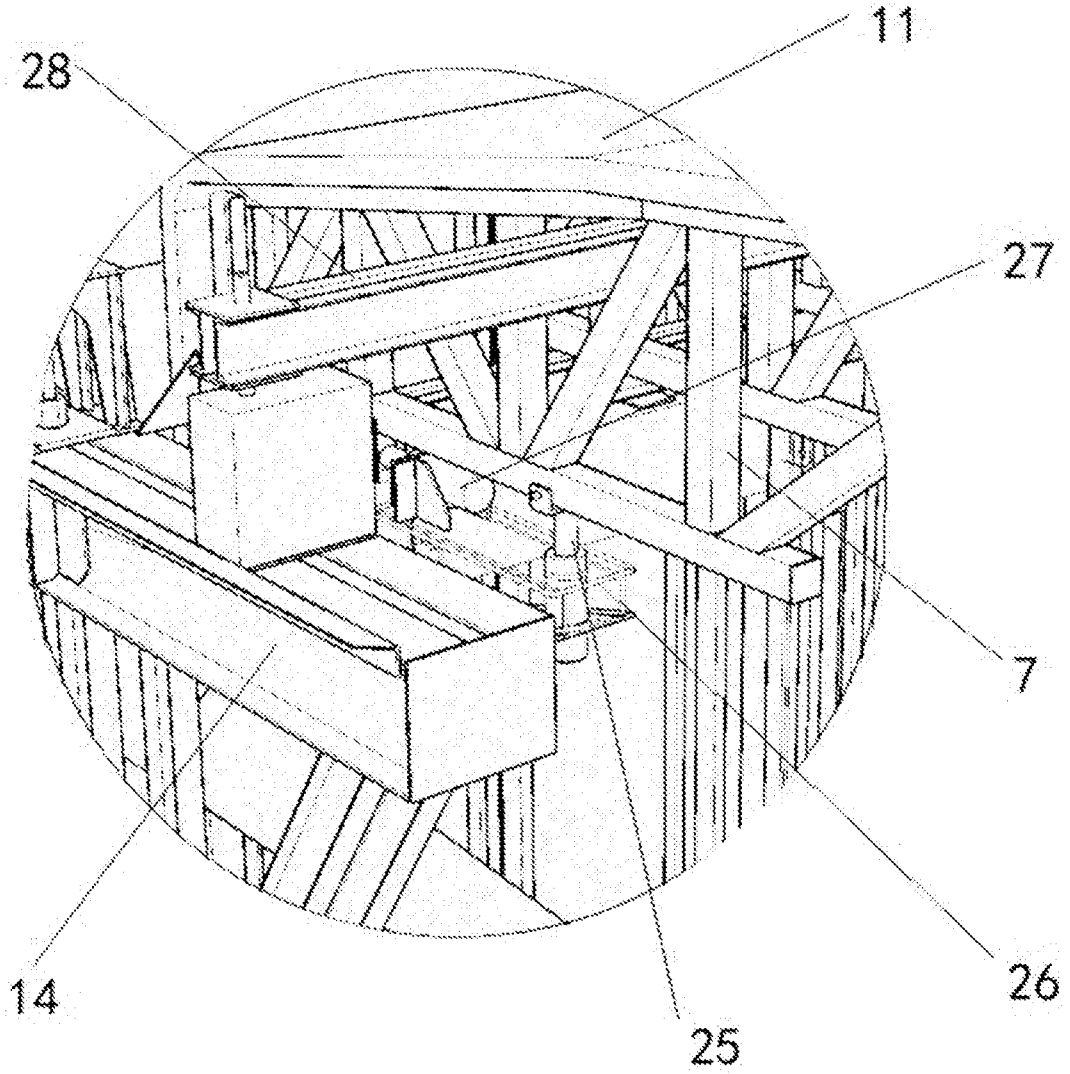


Fig. 8

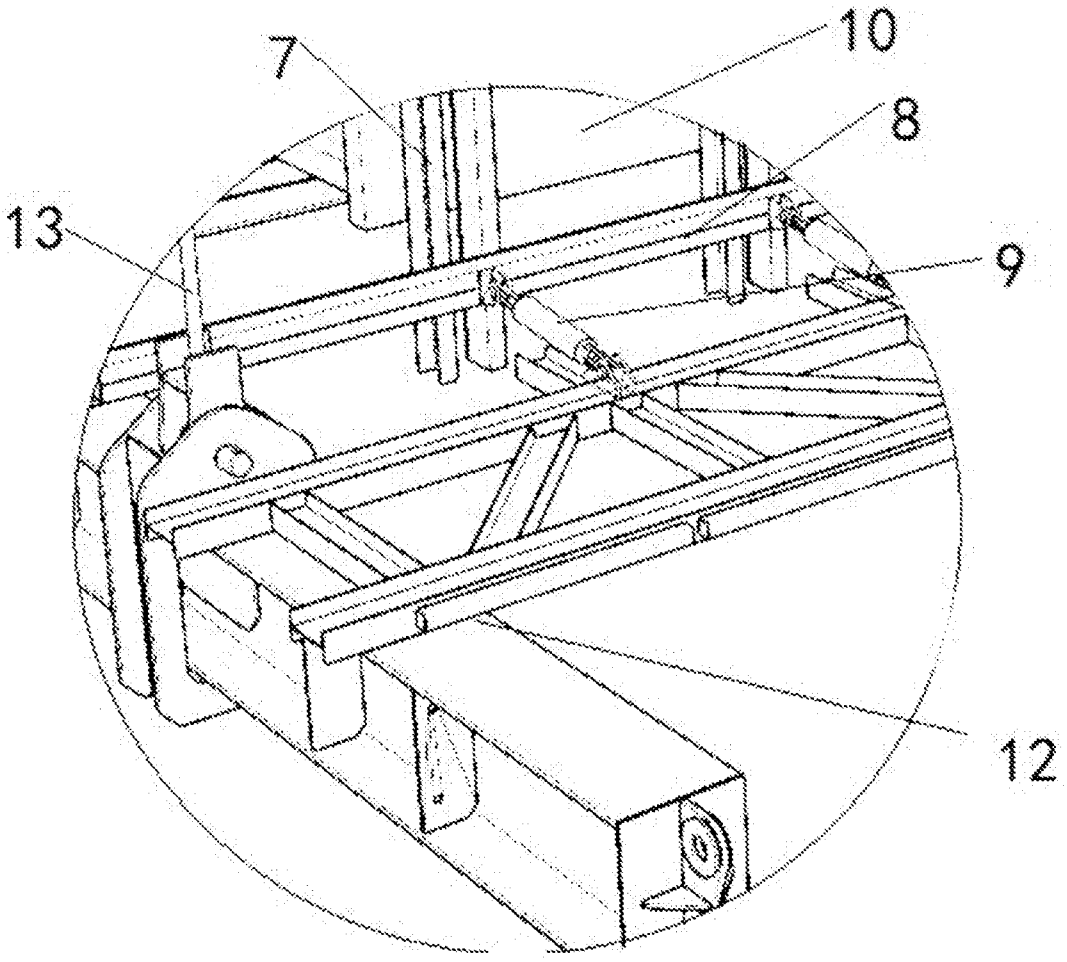


Fig. 9

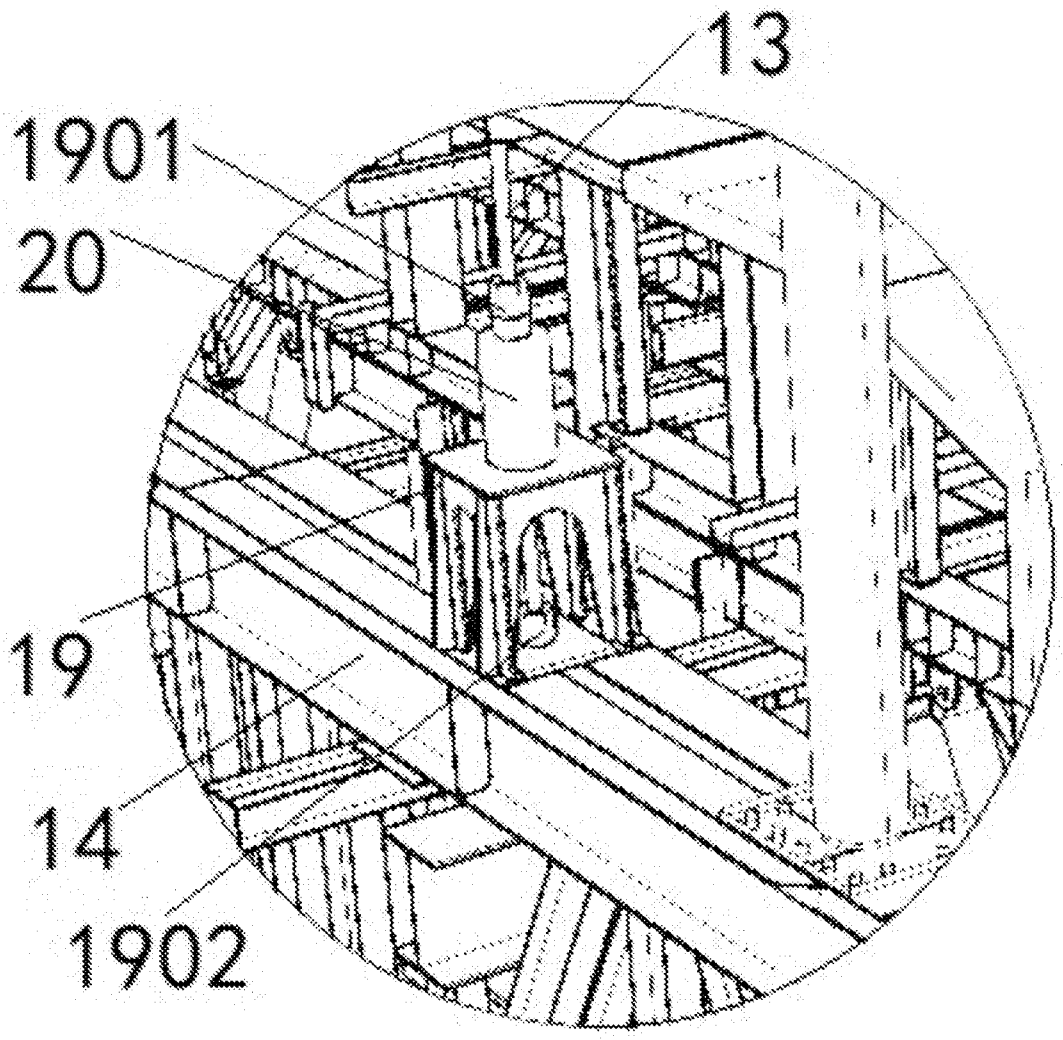


Fig. 10