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(54) COMPACT FORMWORK SYSTEM AND METHOD OF ASSEMBLY THEREOF

(57) The subject of the invention is a compact formwork system, in the form of interconnected panels 19 consisting of an openwork external formwork frame 1, internal transverse beams 4 attached thereto and a cladding 18, made of profiled steel sections. It is characterized by the fact that inside an external formwork frame 1 there is located axially an internal formwork frame 2, to which a movably adjustable assembly support 3 is attached in the upper part, to the rear part of walls of the internal formwork frame 2, the side opposite to the side with the sheathing 18, and above it, in the structure of the internal formwork frame 2, an attachment hook 6 is also movably attached. The attachment hook 6 consists of a tilting hook beam 24 mounted in a pivoting manner between the supporting profiles of the internal formwork frame 2 and an attachment hook eye 23 placed in its upper part. The attachment hook beam 24 is mounted in a pivoting manner on a pivot 22 and equipped with a cotter pin 21. The attachment hook eye 23 is mounted rotationally at the top of the attachment hook beam 24 and is equipped with a spring 20. The distance between the attachment hook 6 and the integral mounting support 3 is such that there is no overlap between the two elements. Vertically, between the internal transverse beams 4, beams 5 are permanently fixed in a decreasing number on each layer of internal beams 4, starting from the bottom of the external formwork frame 1. On the horizontal fragment of the internal formwork frame 1, a connecting lock 7 is mounted permanently having the form of a shaped piece 17 attached in an articulated manner on the external formwork frame 1, terminated with an articulated jaw 25 and a pressure element 28. The adjustable assembly support 3 contains tubular load-bearing profiles 8 - external and internal 8a, 8b, symmetrically moulded on both sides, so that at least a pin mounting mould 11 and a guiding mould 12 are formed in the surface of the tubular load-bearing profiles 8a, 8b, with the load-bearing profiles 8a, 8b having a reduced diameter at their ends. Into the interior of the tubular support profiles 8a, 8b, screw elements 10 with external threads 9 are inserted symmetrically, so that a screw element 10 with a right-hand thread 9a is inserted into one end of the support profile 8 ends, and a screw element 10 with a left-hand thread 9b is inserted into the other end of the tubular support profile 8. Screw elements 10 with external threads 9 on one end feature a joint 13 with a through opening 14. Onto the right-hand thread 9a and the left-hand thread 9b of the screw element 10 with an external thread 9 are screwed thread sleeves 16, right-hand thread 16a and left-hand thread 16b, respectively, and each threaded sleeve 16, at its end not connected with a threaded element 16a, 16b, features an opening 15 for mounting the assembly foot 29.

The subject of the invention is also a method of assembly of a compact formwork system, which according to the invention consists of the stages of lifting the attachment hook 6, attaching the panel 19 using the attachment hook 6 to a sling hook, moving the panel 19 to the intended site, making the panel 19 plumb at the intended site and connecting several panels 19 together. It is characterized in that the: attachment hook 6 spring 20 always sets the attachment hook ear 23 in the

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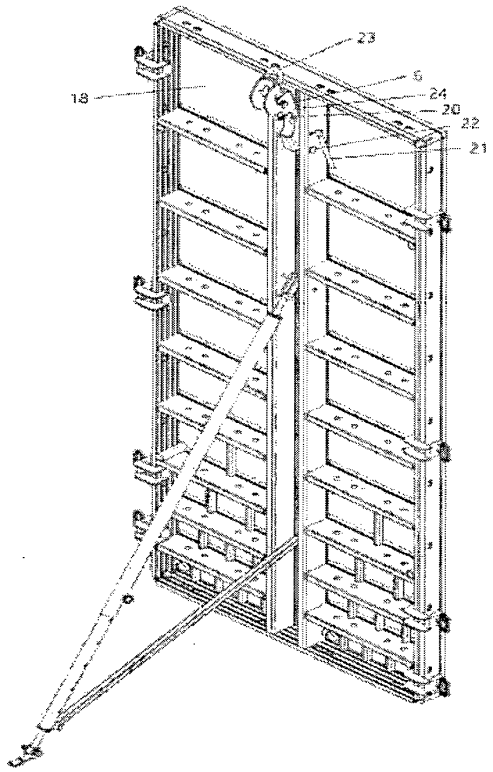
retracted position. In the resting position the attachment hook beam 24 and the attachment eye 23 are entirely within the space of the internal formwork frame 1, without protruding beyond its plane. After connecting the sling hook to the attachment hook eye 23, as lifting is performed, the spring 20 resistance is overcome and the attachment hook eye 23 rotates until it reaches a position above the top of the external formwork frame 1. A thus suspended panel 19 remains in a vertical position. When the panel 19 is made plumb in its intended site, the integral mounting support 3 is released and secured to the surface using a mounting foot 29, and individual panels 19 are connected by moving the connecting lock 7 shaped piece and pressing in with a pressure screw of a pressure element 28. In case mounting platforms or other accompanying equipment are mounted on the side opposite the cladding 18, the attachment hook beam 24 is tilted to the selected position and secured with a cotter pin 21. This will result in a shift in the centre of gravity of the suspended formwork and equipment assembly, allowing the formwork frame to remain vertical.

Fig.3



Description

[0001] The subject of the invention is compact formwork system and method of assembly thereof, applicable to both small- and large-scale construction.

[0002] Contemporary construction uses formwork systems to a great extent. They allow forming monolithic reinforced concrete structures. Wall formwork is the most popular and widespread. In essence, these are metal frames with a sheathing of plywood or plastics, with standardized and modular dimensions. In the case of wall formwork, these are set in a vertical position using a crane or manually in the case of light, small-sized formwork, connected to each other with special locks, and supported to make plumb with special supports set diagonally to the formwork. Provision of support by way of inclined supports, in addition to the aforementioned making plumb, protects the formwork from tipping over during assembly, protects against wind pressure, supports the formwork in case working platforms are installed and, in some cases, transfers horizontal forces resulting from the pressure of fresh concrete.

[0003] The formwork is subjected to forces acting horizontally and vertically, and loads caused by the pressure of the fresh concrete, as well as the concreting process itself. The vertical direction includes the load exerted by the concrete, together with the reinforcement, and the dynamic loads caused by the concreting process. The horizontal direction may include, in addition to the fresh concrete pressure, the following: wind loads, transverse forces from diagonal supports, reactions of lifting apparatus, etc.

[0004] The most critical factor, and the one limiting the height of concreting, is the fresh concrete load. Fresh concrete load is a load (pressure) in the horizontal direction exerted by fresh concrete onto the formwork surface. It depends significantly on the rate of rise achieved during concreting, the concrete's consistency, the temperature and other factors.

[0005] From the perspective of the strength of vertical wall formwork, the hydrostatic pressure acting on the formwork surface plays an important role. The bulk density of fresh concrete is assumed to be gb=25kN/m3. This means the greatest load on the formwork frame occurs in its lower section.

[0006] In the process of formwork assembly conducted at the intended site, construction cranes or self-propelled cranes are commonly used, which allow the formwork to be lifted from a horizontal to a vertical position and then placed at the intended site using slings ending with special hooks.

[0007] In most cases, an inclined assembly support is required to set the formwork in a vertical position.

[0008] Prior art includes formwork systems in the form of metal frames with a sheathing of plywood or plastics with standardized and modular dimensions. They are interconnected using locks constituting a separate assembly element. The locks usually work with a given formwork system.

[0009] From patent description number **P.428858 a formwork lock** is known consisting of a closed profile, to whose two opposite walls or edges jaws are permanently connected, with second jaws mounted on the profile in a sliding manner, and openings made in the profile and the jaw for immobilizing the second jaw using a wedge retaining insert.

[0010] From patent description number **P.433581** is known a moveable panel of a formwork system comprising an external frame, internal ribs and sheathing, made of steel cold-formed profiles, allowing support on a drophead. The adjustable panel of the formwork system features a supporting structure of 1.5 mm thick cold-formed profiled steel sections consisting of long openwork perimeter sections and short perimeter sections with a specially designed Z-shaped cross-section, with full and openwork internal transverse ribs, as well as short longitudinal ribs (5) made of C-shaped sections, and corners allowing panel assembly with a drophead.

[0011] From patent description number DE38263661A1 is known a profile formed from bent sheet metal joined using an overlapping method. This profile has essentially rectangular walls, sections of which may be locally concave. The following walls are distinguished: a transverse assembly wall, through which the assembled profiles are connected with a clamp lock, a plate wall that is in contact with the formwork board, most often made of plywood, and a recess wall featuring a recess for the jaws of the clamp lock.

[0012] The aim of the invention is to strengthen the lower area of the formwork, which will make it possible to use the system for one-time construction of a reinforced concrete wall on a higher surface. The use of an integrated attachment hook will allow system elements to be transported by crane without fear of damaging the external formwork frame. An integrated mounting support facilitates making individual system elements plumb during assembly. It also secures the supported elements while concrete is poured into the formwork. An integrated connecting lock allows for individual system elements to be connected in a quick and easy manner.

[0013] The compact formwork system is designed primarily to improve work efficiency and ergonomics when performing formwork.

[0014] A reinforced lower area of the formwork allows for the transfer of higher loads caused by the hydrostatic pressure of the concrete. The formwork is subjected to forces acting horizontally and vertically, and loads caused by the pressure of the fresh concrete, as well as the concreting process itself. The vertical direction includes the load exerted by the concrete, together with the reinforcement, and the dynamic loads caused by the concreting process. The horizontal direction may include, in addition to the fresh concrete pressure, the following: wind loads, transverse forces from diagonal supports, reactions of lifting apparatus, etc.

[0015] The most critical factor, and the one limiting the

height of concreting, is the fresh concrete load. Fresh concrete load is a load (pressure) in the horizontal direction exerted by fresh concrete onto the formwork surface. It depends significantly on the rate of rise achieved during concreting, the concrete's consistency, the temperature and other factors. From the perspective of the strength of vertical wall formwork, the hydrostatic pressure acting on the formwork surface plays an important role. The bulk density of fresh concrete is assumed to be gb=25kN/m3. This means the greatest load on the formwork frame occurs in its lower section.

[0016] The assembly of contemporary formwork systems at their intended site requires the use of construction cranes or self-propelled cranes equipped with rope or chain slings terminated with a dedicated hook that always works only with a particular formwork system. A crane is used extensively during construction for all possible transport work at the construction site, i.e. the transport of reinforcing steel, timber, blocks, bricks, etc. Often a long queue waits to use a crane. It is a common occurrence that when the time to set up the formwork at its intended site comes, there is no required sling with dedicated hook, and the assemblers attach the sling hook to the edge of the formwork's frame, which usually results in damage to the formwork. In effect, the perimeter profile section of the formwork becomes permanently damaged.

[0017] The solution eliminates this problem. Each formwork frame is equipped with an integrated attachment hook which, when not in use, is hidden in the frame's structure and, when needed, tilted or extended upwards, allowing a sling hook to be attached. Therefore, it is "always at hand"

[0018] The savings resulting from this solution consist mainly of a longer formwork service life and more efficient work at the intended site.

[0019] The formwork frame is almost always equipped in its rear part (opposite to the side with the formwork plywood) with an inclined support or an integrated assembly support, and often with working platforms. This causes significant complications when lifting or setting the formwork resulting from the shift in the centre of gravity, wherein such a situation the working plane of the frame is significantly inclined in relation to the surface. This is particularly troublesome and dangerous when working on multi-storey buildings at significant heights. The option to tilt the mounting hook beam in the proposed solution eliminates this problem.

[0020] Each time formwork is set up at its intended site, at ground level or in an excavation in particular, it needs to be supported. Standard ceiling supports are used, which require heads and feet dedicated to a particular system to be additionally attached. Some systems have supports dedicated to a particular formwork system. It is always a separate element that needs to be stored separately and then mounted to the formwork.

[0021] The solution is characterized by the fact that the support is integrated in the internal space of the formwork frame. At the time of assembly, one needs to simply slide the safety pin and tilt the support to the required position. An additional advantage of the support is the complete protection of threads against mechanical damage or contamination with concrete, which competitive systems do not offer.

[0022] Contemporary formwork systems are usually metal frames filled with waterproof formwork plywood. While available formwork frames are of unified size, each company has its own shape of the frame's perimeter profile. Therefore, each system requires a dedicated connecting element used to connect the frames. Connecting elements, often referred to as locks, are always stored and transported in separate boxes or mesh containers. In each case, when the formwork is being assembled, the necessary number of connecting locks has to be ready. Very often there are too many in one assembly location and too few in another. A common problem is the loss of small formwork accessory items, including connecting locks.

[0023] The solution consists in permanently placing an integrated lock in the formwork frame space, so it is "always at hand" and if one needs to connect a formwork frame to another frame, it is only necessary to tilt, fasten and secure.

[0024] The subject of the invention is a compact formwork system, which according to the invention has the form of interconnected panels consisting of an openwork external formwork frame, internal transverse beams attached thereto and sheathing made of profiled steel sections. It is characterized in the fact that inside an external formwork frame there is located axially an internal formwork frame, to which a movably adjustable assembly support is attached in the upper part, to the rear part of walls of the internal formwork frame, the side opposite to the side with the sheathing, and above it, in the structure of the internal formwork frame, an attachment hook is also movably attached. The attachment hook consists of a pivoting attachment hook beam mounted in a pivoting manner between the supporting profiles of the internal formwork frame and a hook eye placed in its upper part. The attachment hook beam is mounted in a pivoting manner on a pivot and equipped with a cotter pin. The attachment hook eye is mounted in a pivoting manner at the top of the attachment hook beam and is equipped with a spring. The distance between the attachment hook and the integral mounting support is such that there is no overlap between the two elements. Vertically, between the internal horizontal beams, beams were permanently fixed in a decreasing number on each layer of internal beams, starting from the bottom of the external formwork frame. On the internal formwork frame, on the side of attachment of the assembly support, on the horizontal fragment of the external formwork frame, a connecting lock is mounted permanently having the form of a shaped piece attached in an articulated manner on the external formwork frame, terminated with an articulated jaw and a pressure element in the form of a

pressure screw or a wedge. The integral mounting support contains tubular load-bearing profiles - external and internal symmetrically moulded on both sides, so that at least a pin mounting mould and a guiding mould are formed in the surface of the tubular load-bearing profiles, with the load-bearing profiles having a reduced diameter at their ends. Into the interior of the tubular load-bearing profiles, screw elements with external threads are inserted symmetrically, so that a screw element with a right-hand thread is inserted into one end of the load-bearing profile, and a screw element with a left-hand thread is inserted into the other end of the tubular load-bearing profile. Screw elements with external threads on one end feature a joint with a through opening. Onto the right-hand thread and the left-hand thread 9b of the screw element with an external thread are screwed on right-hand thread and left-hand thread sleeves, respectively, and each threaded sleeve, at its end not connected with a threaded element, features an opening for mounting the assembly foot.

[0025] Preferably there are fewer than one beam.

[0026] Preferably the through opening has a diameter equal to the diameter of the mounting socket of the pivot mounting moulding.

[0027] Preferably the pressure element has the form of a pressure screw.

[0028] Preferably the pressure element has the form of a wedge.

[0029] The subject of the invention is also a method of assembly of a compact formwork system, which according to the invention consists of the stages of lifting the attachment hook, attaching the panel using the attachment hook to a sling hook, moving the panel to the intended site, making the panel plumb at the intended site and connecting several panels together. It is characterized in that the attachment hook spring always sets the attachment hook eye in the retracted position. In the resting position the attachment hook beam and the attachment hook eye are entirely within the space of the internal formwork frame, without protruding beyond its plane. After connecting the sling hook to the attachment hook eye, as lifting is performed, the spring resistance is overcome and the attachment hook eye rotates until it reaches a position above the top of the external formwork frame. A panel suspended in this manner remains in a vertical position. When the panel is made plumb at its intended site, the integral mounting support is released and secured to the surface using a mounting foot, and individual panels are connected by moving the connecting lock bolt and pressing in with a set screw or wedge.

[0030] In case mounting platforms or other accompanying equipment are mounted on the side opposite the sheathing, the attachment hook beam is tilted to the selected position and secured with a cotter pin. This will result in a shift in the centre of gravity of the suspended formwork and equipment assembly, allowing the formwork frame to remain vertical.

[0031] The compact formwork system allows work efficiency and ergonomics when performing formwork to be improved.

[0032] Thanks to a reinforced lower area of the panel, higher loads resulting from the hydrostatic pressure of the concrete can be transferred.

[0033] Thanks to reinforcement in the lower area of the panel, the system can be used for implementing one-time formwork of a higher surface. This is possible thanks to the use of transverse reinforcing beams. The quantity of those can be adjusted in any way, allowing the forces acting on the formwork to be mitigated.

[0034] Thanks to the use of a built-in integral attachment hook, the system elements can be transported by crane without the threat of damage to the external formwork frame.

[0035] The integral mounting support facilitates making plumb the individual elements of the system during installation. It also secures the supported elements while concrete is poured into the formwork.

[0036] Thanks to the built-in connecting lock, individual system elements can be quickly and easily interconnected.

[0037] Thanks to the option of tilting the attachment hook beam, terminated with a rotating attachment hook eye, by any angle, and therefore shifting the centre of gravity of the entire assembly (formwork and accessories), the plane of the formwork frame remains vertical.

[0038] Thanks to the telescopic design of the support, its extension length can be modified to suit the needs of a particular construction site. This is possible thanks to the use of a series of linear aligned openings in the inner profile and an opening in the outer profile and a locating pin. This is particularly important in excavations or locations with limited access. The support also features a system for precise length adjustment by way of a right-hand thread hidden inside both its ends, and a left-hand thread on the opposite end, thus by turning the support it makes plumbing the formwork easier at the intended site. The lower part of the support is finished with a mounting bracket used to secure it to the surface and an adjustable brace used to connect the mounting bracket with the internal frame of the formwork.

[0039] The use of a cotter pin allows precise positioning of the attachment hook beam.

[0040] Thanks to the attachment hook eye being equipped with a spring and its pivot mount in the upper part of the beam, it is always possible to set the attachment hook eye in the retracted position.

[0041] After connecting the sling hook to the attachment hook eye, as lifting is performed, the spring resistance is overcome and the attachment hook eye rotates until it reaches a position above the upper part of the frame. In such an arrangement, the suspended formwork frame remains in a vertical position, allowing its placement at the intended site.

[0042] Thanks to the panel being attached using a hook, it can be oriented vertically, which allows it to be placed at its intended site.

Explanation of drawing figures

[0043] The embodiments of the subject of the invention are presented in the drawings, wherein: fig. 1 shows the formwork panel with the integral mounting support and integral attachment hook, fig. 2 shows a formwork panel connected to a further formwork panel using an integral connecting lock and an unfolded integral mounting support and integral attachment hook, and fig. 3 shows the formwork panel with an unfolded integral mounting support and integral attachment hook and the tilted attachment hook beam, fig. 4 presents the structure of an integral mounting support.

Embodiments

[0044] **In each of the embodiments** the subject of the invention is a compact formwork system in the form of interconnected panels 19 consisting of an openwork external formwork frame 1, transverse internal beams 4 attached thereto and a sheathing 18, made of steel profiled sections. It is characterized by the fact that inside an external formwork frame 1 there is located axially an internal formwork frame 2, to which a movably adjustable assembly support 3 is attached in the upper part, to the rear part of walls of the internal formwork frame 2, the side opposite to the side with the sheathing 18, and above it, in the structure of the internal formwork frame 2, an attachment hook 6 is also movably attached. The attachment hook 6 consists of a tilting hook beam 24 mounted in a pivoting manner between the supporting profiles of the internal formwork frame 2 and an attachment hook eye 23 placed in its upper part. The attachment hook beam 24 is mounted in a pivoting manner on a pivot 22 and equipped with a cotter pin 21. The attachment hook eye 23 is mounted rotationally at the top of the attachment hook beam 24 and is equipped with a spring 20. The distance between the attachment hook 6 and the integral mounting support 3 is such that there is no overlap between the two elements. Vertically, between the internal transverse beams 4, beams 5 are permanently fixed in a decreasing number on each layer of internal beams 4, starting from the bottom of the external formwork frame 1. On the horizontal fragment of the internal formwork frame 1, a connecting lock 7 is mounted permanently having the form of a shaped piece 17 attached in an articulated manner on the external formwork frame 1, terminated with an articulated jaw 25 and a pressure element 28. The adjustable assembly support 3 contains tubular load-bearing profiles 8 - external and internal 8a, 8b, symmetrically moulded on both sides, so that at least a pin mounting mould 11 and a guiding mould 12 are formed in the surface of the tubular load-bearing profiles 8a, 8b, with the load-bearing profiles 8a, 8b having a reduced diameter at their ends. Into the interior of the tubular support profiles 8a, 8b, screw elements 10 with external threads 9 are inserted symmetrically, so that a screw element 10 with a right-hand thread 9a is inserted into one end of the support profile 8 ends, and a screw element 10 with a left-hand thread 9b is inserted into the other end of the tubular support profile 8. Screw elements 10 with external threads 9 on one end feature a joint 13 with a through opening 14. Onto the right-hand thread 9a and the left-hand thread 9b of the screw element 10 with an external thread 9 are screwed thread sleeves 16, right-hand thread 16a and left-hand thread 16b, respectively, and each threaded sleeve 16, at its end not connected with a threaded element 16a, 16b, features an opening 15 for mounting the assembly foot 29.

[0045] **In each embodiment,** the subject of the invention is also a method of assembly of the compact formwork system consisting of the stages of lifting the attachment hook 6, attaching the panel 19 using the attachment hook 6 to a sling hook, moving the panel 19 to the intended site, making the panel 19 plumb at the intended site and connecting several panels 19 together. It is characterized in that the: attachment hook 6 spring 20 always sets the attachment hook eye 23 in the retracted position. In the resting position the attachment hook beam 24 and the attachment eye 23 are entirely within the space of the internal formwork frame 2, without protruding beyond its plane. After connecting the sling hook to the attachment hook eye 23, as lifting is performed, the spring 20 resistance is overcome and the attachment hook eye 23 rotates until it reaches a position above the top of the external formwork frame 1. A thus suspended panel 19 remains in a vertical position. When the panel 19 is made plumb in its intended site, the integral mounting support 3 is released and secured to the surface using a mounting foot 29, and individual panels 19 are connected by moving the connecting lock 7 shaped piece 17 and pressing in with a set screw 26 of a pressure element 28.

Example 1

[0046] In the first embodiment there are no fewer beams 5 than one.

Example 2.

[0047] In the second embodiment, the through opening 14 has a diameter equal to the diameter of the mounting socket of the mounting moulding of the pin 10.

Example 3.

[0048] In the third embodiment, the pressure element 28 is in the form of a pressure screw 26.

Example 4.

[0049] In the fourth embodiment, the pressing element 28 has the form of a wedge 22.

Example 5.

[0050] In the fifth embodiment, the method of assembly is characterized in that mounting platforms or other accompanying equipment are mounted on the side opposite to the sheathing 18 to the panel 19, the attachment hook beam 24 needs to be tilted to the selected position and secured with the cotter pin 21.

Claims

1. **A compact formwork system** in the form of connected panels (19) comprising an openwork external formwork frame (1), internal transverse beams (4) fastened to it and a cladding (18), made of profiled steel sections **characterized in that** inside the external formwork frame (1) an internal formwork frame (2), in whose upper part, to the walls of the internal formwork frame (2) in its back part, opposite to the side with the cladding (18), a moveable adjustable assembly support (3) is attached, and above it in the structure of the internal formwork frame (2), an attachment hook (6) is also movably fastened; the attachment hook (6) consists of a tilting attachment hook beam (24) mounted rotationally between the supporting profiles of the internal formwork frame (2) and the attachment hook eye (23) located in its upper part; a tilting attachment hook beam (24) is mounted rotationally on a pin (22) and is equipped with a cotter pin (21); the attachment hook eye (23) is rotationally mounted in the upper part of the tilting attachment hook (24) and is equipped with a spring (20); the distance between the attachment hook (6) and the integral mounting support (3) is such that both elements do not overlap; vertically, between the transverse internal beams (4), beams (5) are mounted in a fixed manner in a decreasing number on each layer of internal beams (4) starting from the bottom of the external formwork frame (1); on the horizontal fragment of the external formwork frame (1) a connecting lock (7) is permanently mounted, in the form of a shaped piece (17) attached in an articulated manner to the external formwork frame (1), ending with an articulated jaw (25) and a pressure element (28); the adjustable mounting support (3) comprises tubular load-bearing profiles (8) - an external and an internal one (8a, 8b), embossed symmetrically on both sides, so that at least a pin mounting moulding (11) and a guiding moulding (12) are created in the surface of the tubular load-bearing profiles (8a, 8b), and the load-bearing profiles (8a and 8b) have a reduced diameter at their ends; into the interior of the tubular loab-bearing profiles (8a, 8b) there are introduced symmetrically screw elements (10) with external threads (9) so that a screw element (10) with a right-hand thread (9a) is inserted into one end of the support profile (8), and a screw element (10) with a left-hand thread (9b) is inserted into the other end of the tubular support profile (8), the screw elements (10) with external threads (9) are equipped with a joint (13) at one end, through which a through opening (14) passes, onto the right-hand thread (9a) and left-hand thread (9b) of the screw element (10) threaded sleeves (16) are screwed on with an external thread (9), respectively, with a right-hand thread of the sleeve (16a) and a left-hand thread of the sleeve (16b), respectively, and each threaded sleeve (16), at its end not cooperating with the threaded element (16a, 16b) is equipped with a mounting opening (15) for the mounting foot (29).

2. A compact formwork system according to claim 1, **characterized in that** there is at least one beam (5).

3. The compact formwork system according to claim 1 or 2, **characterized in that** the through opening (14) has a diameter equal to the diameter of the fastening socket of the moulding for the pin fastening (10).

4. The compact formwork system according to claim 1 or 2 or 3, **characterized in that** a pressure element (28) has the form of a pressure screw (26).

5. The compact formwork system according to claim 1 or 2 or 3, **characterized in that** the pressure element (28) has the form of a wedge (27).

6. A method of assembly of a compact formwork system as disclosed in claims 1 to 4, comprising the following steps: lifting the attachment hook (6), connecting the panel (19) using the attachment hook (6) to the sling hook, moving the panel (19) to the intended site, making the panel (19) plumb at the intended site, connecting several panels (19) with each other, **characterized in that**: the spring (20) of the attachment hook (6) always sets the attachment hook eye (23) in the retracted position; in the rest position, the tilting attachment hook beam (24) and the attachment hook beam (23) are located entirely within the space of the internal formwork frame (2) without protruding beyond its plane; after the sling hook is connected to the attachment hook eye (23), the resistance of the spring (20) is overcome during lifting and the attachment hook eye (23) rotates until it is in a position above the upper part of the external formwork frame (1); the suspended panel (19) remains in a vertical position; after the panel (19) is made plumb at the desired site , the integral assembly support (3) is released and fixed to the surface using the assembly foot (29), and the individual panels (19) are connected by rotating the shaped part (17) of the connecting lock (7) and pressing it using the pressing element (28).

7. The method of assembly according to claim 6 **char-**

acterized in that mounting platforms or other accompanying equipment are mounted on the side opposite to the sheathing (18) to the panel (19), the attachment hook beam (24) of the connecting lock (7) needs to be tilted to the selected position and secured with a cotter pin (21).

Fig.1

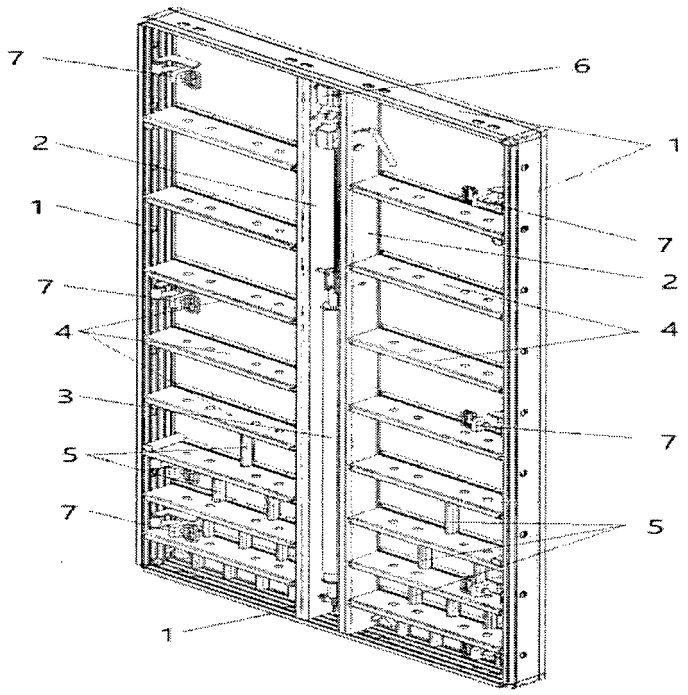

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Fig.2

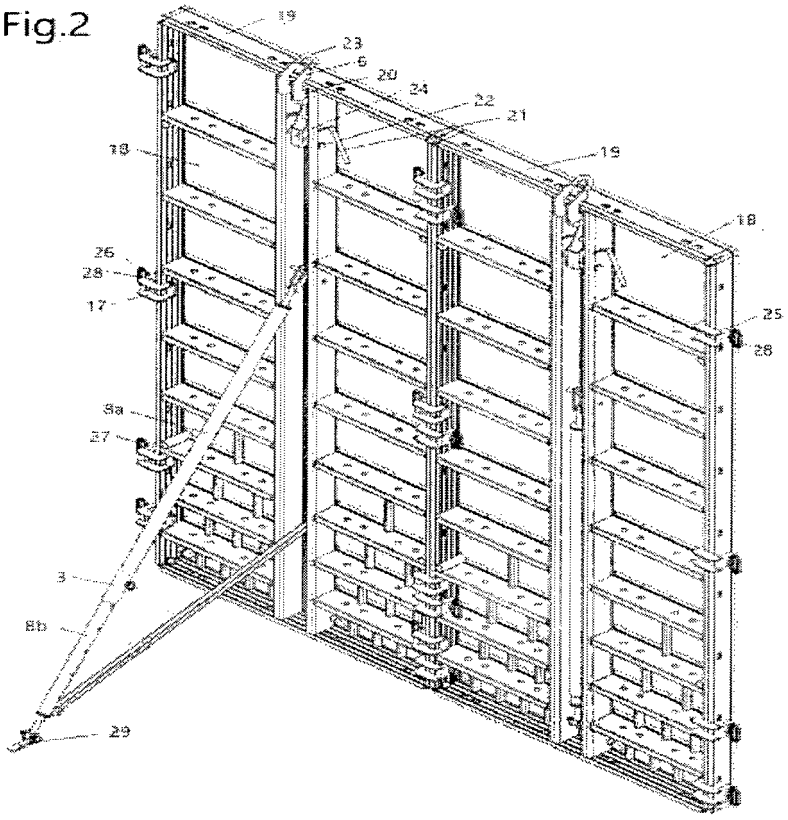
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Fig.3

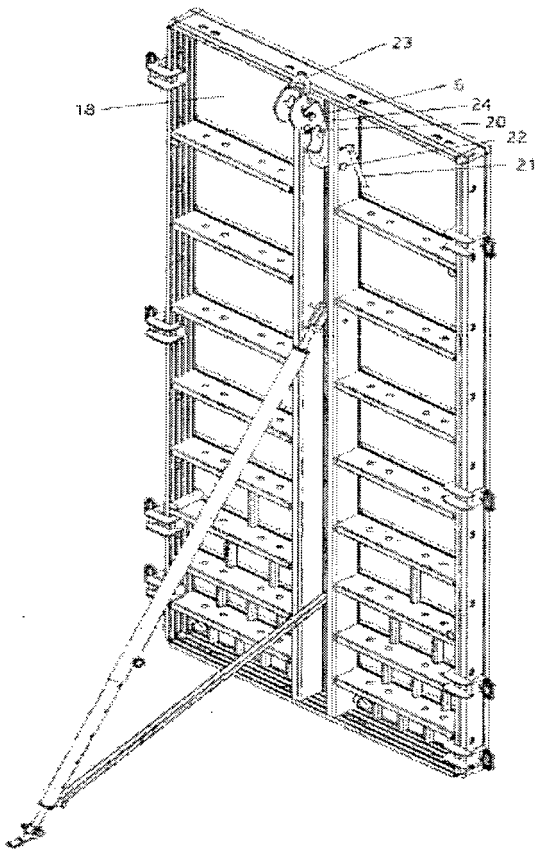
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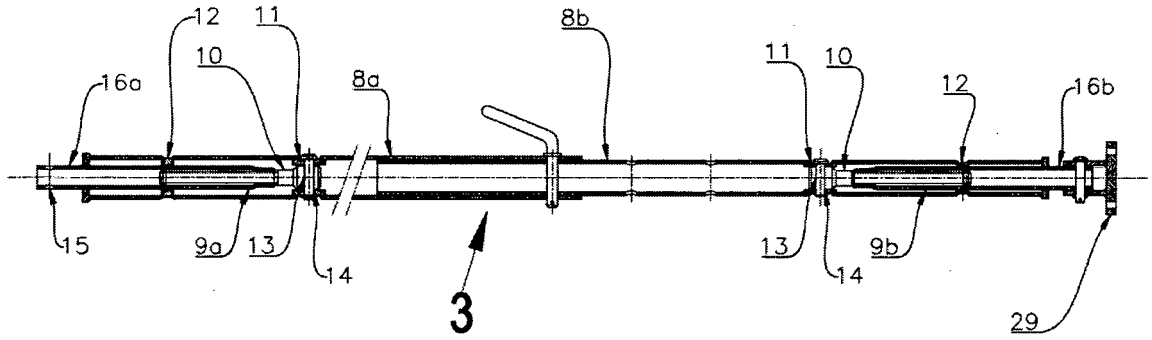
Fig. 4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8a
8b
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16b
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9a
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9b
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Place of search	Date of completion of the search	Examiner
The Hague	3 March 2025	Baumgärtel, Tim

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