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(54) SCAFFOLDING AND INTERMEDIATE ELEMENT THEREFOR

GERÜST UND ZWISCHENELEMENT DAFÜR

ECHAFFAGE ET SON ÉLÉMENT INTERMÉDIAIRE

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Description

[0001] The present invention relates to a scaffolding, comprising a system of scaffold elements, comprising uprights and ledgers which extend therebetween and are coupled to the uprights, and comprising at least one intermediate element which mutually connects a first scaffold element and a second scaffold element at least substantially along a mutual perpendicular line.

[0002] A scaffolding of the type described in the preamble is applied on large scale during work at height on buildings and installations. Normally erected here along a contour of the structure is a scaffolding of usually tubular uprights and ledgers extending therebetween, these together defining a system of scaffold sections lying adjacently of each other and above each other. The ledgers here moreover provide, in addition to a structural cohesion, a basis for placing floor parts whereby the scaffold sections are accessible to and can be walked on by workers. An additional ledger is often arranged on an exposed side halfway along a scaffold section and serves here as rail and fall protection. The scaffolding is usually anchored mechanically to the structure and provides from that moment a safe working environment from which maintenance and building operations can be carried out.

[0003] For sufficient strength and load-bearing capacity, intermediate elements are often arranged diagonally between adjacent scaffold elements, and thereby form a diagonal. This provides additional cohesion, and thereby rigidity, to the scaffolding. They are usually elongate tube bodies which are coupled to the relevant scaffold segment on either side by means of a tube coupling. These couplings are here often situated at different heights, whereby a scaffolder must sometimes kneel down on a first side, while a connection must be made at standing height or above on an opposite side. This causes considerable physical strain and moreover impedes a smooth scaffolding construction.

[0004] KR 101 011 595 B1 discloses a scaffolding with an intermediate element.

[0005] The present invention has for its object, among others, to provide a scaffolding with an intermediate element which can be placed therein in efficient manner.

[0006] In order to achieve the intended object a scaffolding according to claim 1 is provided.

[0007] The scaffolding according to the invention more particularly has the feature here that by a rotation of the intermediate element about an axis thereof the hook members are adjustable between a position in which they engage round the first scaffold element and a position in which they release the first scaffold element. In this latter position the intermediate element can be disengaged from the first scaffold element in simple manner, while it is coupled thereto in the first stated position.

[0008] Said axis coincides here at least substantially with the perpendicular line along which the intermediate element connects the two scaffold elements mutually connected thereby. For a coupling of the intermediate

element at this distal outer end to the first scaffold element it thus suffices for the scaffold element to be brought between the two hook members, after which a connection to the scaffold element can be brought about by a simple rotation of the intermediate element about its longitudinal axis. Coupling and disengaging of the intermediate element can thus be performed wholly on site. A scaffolder is able to perform these manipulations at a distance from the first scaffold element and need not kneel down for this purpose, nor reach or move to a different position. The same applies when the scaffolding is dismantled afterwards, wherein the two manipulations are performed in reverse order.

[0009] In a particular embodiment the scaffolding according to the invention is characterized in that the first scaffold element is tubular and the hook members are at least substantially identical in form and each have a substantially U-shaped jaw. The scaffolding is thereby in line with common scaffold elements which are generally constructed from tubular scaffold elements. The hook members here particularly have a U-shaped jaw with a curve which is concentric to the first scaffold element. A preferred embodiment of the scaffolding according to the invention is more particularly characterized here in that the hook members lie round the first scaffold element in at least substantially form-fitting manner. Such a placement of the intermediate element on the first scaffold element minimizes a mutual clearance, which enhances the rigidity and strength of the scaffolding.

[0010] According to the invention the intermediate element comprises a duct-like body and is particularly tubular. Such a construction is in line with common scaffold elements in a scaffolding. According to the invention the hook members are mounted on opposite flanks of the intermediate element, and that the hook members are substantially plate-like, at least were separated from a plate. The hook members thus comprise a set of side pieces which are connected to the duct-like body by means of common connecting techniques, such as welding or screwing, in order to receive therebetween the scaffold element to be connected.

[0011] Although the connection between the intermediate element and the first scaffold element per se prevents an unintended separation between the two, a simple rotation through a quarter turn suffices to break the connection. In order to prevent this, a further preferred embodiment of the scaffold element has the feature according to the invention that the intermediate element comprises at an opposite, second distal outer end a scaffold coupling and, with interposing thereof, is coupled non-rotatably to a second scaffold element. The scaffold coupling thus prevents a rotation of the intermediate element, whereby the connection at the opposite outer end would otherwise be broken.

[0012] A particular embodiment of the scaffolding according to the invention has the feature here that the scaffold coupling comprises a set of at least substantially parallel hook members which extend from the second outer

end of the intermediate element and each engage with an at least substantially cup-like jaw round the second scaffold element connected thereto, wherein the hook members have at least substantially the same orientation so that the jaws engage round the second scaffold element from the same side, wherein a latch is provided which locks the second scaffold element non-rotatably from an opposite side. The hook members can here be similar or even identical to the hook members which are applied at the first outer end, albeit that the two hook members are here connected to the intermediate element in the same orientation. The latch locks the second scaffold element in the coupling and thus prevents breaking of the scaffold coupling and furthermore a rotation of the intermediate element about its axis, so that the opposite coupling to the first scaffold element is also locked thereby.

[0013] In a further embodiment the scaffolding according to the invention is characterized here in that the second scaffold element is tubular and the scaffold coupling comprises a tube clamp which engages clampingly round the second scaffold element. The tube clamp provides for a tightly clamped connection to the second scaffold element and furthermore prevents a rotation of the intermediate element about its axis, so that the opposite coupling to the first scaffold element is also locked.

[0014] The invention will be further elucidated hereinbelow with reference to an exemplary embodiment and an accompanying drawing. In the drawing:

- Figure 1 shows an exemplary embodiment of a scaffolding according to the invention;
- Figure 2 shows a side view of an intermediate element as applied in the scaffolding of figure 1;
- Figure 3 shows a perspective view of a first distal outer end of the intermediate element of figure 2;
- Figure 4 shows a perspective view of an opposite, second distal outer end of the intermediate element of figure 2; and
- Figures 5A-5F show the scaffolding of figure 1 at successive stages of a fastening of the intermediate element of figure 2 therein.

[0015] It is otherwise noted here that the figures are purely schematic and not always drawn to (the same) scale. Some dimensions in particular may be exaggerated to greater or lesser extent for the sake of clarity. Corresponding parts are designated in the figures with the same reference numeral.

[0016] Figure 1 shows a common system of mutually connected uprights 10 and horizontal ledgers 20 from which a scaffolding can be constructed. In this example the horizontal ledgers 20 are coupled to uprights 10 by means of system couplings 12, for which purpose the uprights are provided at regular distances with such couplings and the ledgers are provided at their outer ends

with matching coupling members. This example relates to a so-called cuplock system, although the invention can likewise be applied in other types of system scaffolds and also in non-system scaffolds, wherein a mutual connection between uprights and ledgers is brought about only or mainly by means of tube couplings. From a viewpoint of strength and durability, use is usually made here of thick-walled hollow scaffold elements of steel or aluminium; so-called scaffolding tubes or scaffolding pipes.

[0017] In practice the scaffolding can comprise both in height direction and laterally a plurality of the construction shown in figure 1 and thereby completely cover an outer wall portion to be worked on. The (lowermost) uprights 10 have at their base a rotatable foot 15 whereby uprights 10 can be adjusted if necessary, so that the whole is securely positioned. Besides providing structural cohesion, ledgers 20 also serve as a basis for scaffold floor parts from which a scaffold floor is constructed per level.

[0018] Intermediate elements 30, which form a diagonal in the scaffolding in and/or outside a scaffold section, are arranged for the purpose of additional load-bearing capacity and rigidity. In this case such an intermediate element 30 is arranged between a first ledger 21 and a second ledger 22, each at a different level, but such intermediate elements can also be applied between ledgers at the same level and between uprights, optionally in the same row. The intermediate element comprises an elongate duct-like body, in this case with a rectangular and even square cross-section, for which use is in practice also made of aluminium or steel. Instead of this, it is also possible to opt for a tube body with a round cross-section, and a solid body can also be applied, although with a view to weight and bending stiffness use is preferably made of a hollow duct-like body.

[0019] At a first distal outer end two hook members 31, 32 extend from intermediate element 30, see also figures 2 and 3. The two hook members comprise a U-shaped jaw 40 whereby the hook members engage round a first ledger 21, see also figure 2. The two hook members are substantially plate-like and were therefore separated from a steel or aluminium plate, typically with a material thickness of between 5 and 15 millimetres. At their base the two hook members 31, 32 are connected by means of screwing or welding to the distal outer end of the intermediate element 30. The flanks of the rectangular tube which is used for intermediate element 30 in this example provide an ideal mounting base for hook members 31, 32. As shown in figure 3, the two hook members have here an opposite orientation so that the two hook members 31, 32 will engage from opposite sides round the first ledger 21 to be connected thereto. Hook members 31, 32 maintain a mutual distance w which roughly corresponds to a diameter of ledger 21 or is (slightly) greater.

[0020] The intermediate element has on an opposite, second distal outer end a similar set of hook members 33, 34, see figure 4. Other than the first set of hook members 31, 32, this set has the same orientation, and both hook members fall with their U-shaped jaw 40 from a

common side over second ledger 22. A latch 35 locks the second scaffold element 22 on an opposite side. Latch 35 is here wedge-shaped and is arranged via a wedge mortise 36, see figure 4, with clamping fit between on one side the outer end of intermediate element 30 and on the other the second scaffold element 22, so that a non-rotatable, play-free locking and connection is obtained.

[0021] Figures 5A-5F show schematically successive stages of the fastening of the intermediate element 30 to the two ledgers 21, 22. Intermediate element 30 is firstly placed with the first distal outer end, which is provided with the two hook members 31, 32 with opposite orientation, at first ledger 21, see figure 5A. Intermediate element 30 is placed with both hook members 31, 32 over ledger 21, wherein ledger 21 is received between the two hook members, see figure 5B. Hook members 31, 32 now lie with their jaw parallel to an axis of ledger 21 and are not yet connected. The distance *w* here allows ledger 21 to be received between the two hook members 31, 32.

[0022] In order to bring about a connection the intermediate element 30 is rotated about its longitudinal axis through a quarter turn, see figures 5C and 5D, so that hook members 31, 32 are now positioned with their respective jaws transversely of the axis of ledger 21. The hook members however engage round ledger 21 from opposite sides so that a connection is now brought about. This was realizable entirely from a distance; it was not necessary for the scaffolder to kneel or reach toward first ledger 21 for this purpose.

[0023] At an opposite outer end the intermediate element is placed with the hooks 33, 34 provided there over the second ledger, see figures 5E and 5F, and latch 35 is knocked into place. Intermediate element 30 now lies immovably between the two ledgers 21, 22, and provides thereby additional load-bearing capacity and structural cohesion in the scaffolding. It is only at the position of the second scaffold element 22 that the scaffolder had to be present in order to knock latch 35 into place there. The invention thereby provides a particularly practical intermediate element 30 which can be advantageously applied in scaffolding of diverse nature and size.

[0024] Although the invention has been further elucidated above with reference to only a single exemplary embodiment, it will be apparent that the invention is by no means limited thereto. On the contrary, many variations and embodiments are still possible within the scope of the claims for a person with ordinary skill in the art.

[0025] In the given example only the first distal outer end of the intermediate element is thus provided with a set of hook members with opposite orientation, but a similar set can also be provided at the opposite, second distal outer end. In that case the same rotating movement suffices to realize a connection to the relevant ledger 21, 22 at both the first and the second distal outer end. A tube clamp can also be provided at the second distal outer end for the purpose of a connection to the second ledger or the second scaffold element. And besides being pos-

sible between ledgers, a similar connection is also possible between opposite uprights.

5 Claims

1. Scaffolding, comprising a system of scaffold elements, comprising uprights (10) and ledgers (20-22) which extend therebetween and are coupled to the uprights (10), and comprising at least one intermediate element (30) which mutually connects a first scaffold element (21) and a second scaffold element (22) at least substantially along a mutual perpendicular line, wherein the intermediate element (30) comprises an elongate body from which extends at a distal outer end a set of at least substantially parallel hook members (32,32), each having an at least substantially cup-like jaw which engages round the first scaffold element (21) connected thereto, and wherein the hook members (32,32) have an opposite orientation so that the jaws engage round the first scaffold element (21) from opposite sides and here maintain a mutual distance which is greater than a distance between the opposite sides of the first scaffold element (21), wherein the hook members (31,32) are substantially plate-like, and wherein the intermediate element (30) comprises a duct-like body,
characterized in that

said substantially plate-like hook members (31, 32) were at least separated from a plate, and **in that** the hook members (31, 32) are mounted on opposite flanks of the intermediate element (30).

2. Scaffolding according to claim 1, **characterized in that**, by a rotation of the intermediate element (30) about an axis thereof, the hook members (32,32) are adjustable between a position in which they engage round the first scaffold element (21) and a position in which they can be released from the first scaffold element (21).

3. Scaffolding according to claim 1 or 2, **characterized in that** the first scaffold element (21) is tubular and the hook members (32,32) are at least substantially identical in form and each have a substantially U-shaped jaw.

4. Scaffolding according to claim 1, 2 or 3, **characterized in that** the hook members (32,32) lie round the first scaffold element (21) in at least substantially form-fitting manner.

5. Scaffolding according to one or more of the preceding claims, **characterized in that** the intermediate element (30) comprises at an opposite, second distal outer end a scaffold coupling and, with interposing

thereof, is coupled non-rotatably to a second scaffold element.

6. Scaffolding according to claim 5, **characterized in that** the second scaffold element is tubular and the scaffold coupling comprises a tube clamp which engages clampingly round the second scaffold element.
7. Scaffolding according to claim 5, **characterized in that** the scaffold coupling comprises a set of at least substantially parallel hook members (32,32) which extend from the second outer end of the intermediate element (30) and each engage with an at least substantially cup-like jaw round the second scaffold element connected thereto, wherein the hook members (32,32) have at least substantially the same orientation so that the jaws engage round the second scaffold element from the same side, wherein a latch is provided which locks the second scaffold element non-rotatably from an opposite side.

Patentansprüche

1. Gerüst, umfassend ein System von Gerüstelementen, umfassend Ständer (10) und Riegel (20-22), die sich dazwischen erstrecken und mit den Ständern (10) verbunden sind, und umfassend mindestens ein Zwischenelement (30), das ein erstes Gerüstelement (21) und ein zweites Gerüstelement (22) zumindest im Wesentlichen entlang einer wechselseitig zueinander senkrechten Linie miteinander verbindet, wobei das Zwischenelement (30) einen länglichen Körper umfasst, von dem sich an einem distalen äußeren Ende ein Satz von zumindest im Wesentlichen parallelen Hakenelementen (31, 32) erstreckt, von denen jedes eine zumindest im Wesentlichen becherartige Backe umfasst, die um das erste Gerüstelement (21), das damit verbunden ist, herum greift, und wobei die Hakenelemente (31, 32) eine entgegengesetzte Ausrichtung haben, so dass die Backen um das erste Gerüstelement (21) auf entgegengesetzten Seiten herum greifen und hier einen wechselseitigen Abstand beigehalten, der größer als ein Abstand zwischen den entgegengesetzten Seiten des ersten Gerüstelements (21) ist, wobei die Hakenelemente (31, 32) im Wesentlichen plattenartig sind und wobei das Zwischenelement (30) einen kanalartigen Körper umfasst, **dadurch gekennzeichnet, dass** die im Wesentlichen plattenartigen Hakenelemente (31, 32) an entgegengesetzten Flanken des Zwischenelements (30) angebracht sind.
2. Gerüst nach Anspruch 1, **dadurch gekennzeichnet, dass** die Hakenelemente (32, 32) durch eine Drehung des Zwischenelements (30) um eine Achse

desselben zwischen einer Position, in der sie das erste Gerüstelement (21) umgreifen, und einer Position, in der sie von dem ersten Gerüstelement (21) gelöst werden können, verstellbar sind.

3. Gerüst nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das erste Gerüstelement (21) rohrförmig ist und die Hakenelemente (32, 32) zumindest im Wesentlichen identisch geformt sind und jeweils eine im Wesentlichen U-förmige Backe aufweisen.
4. Gerüst nach Anspruch 1, 2 oder 3, **dadurch gekennzeichnet, dass** die Hakenelemente (32, 32) zumindest im wesentlichen formschlüssig um das erste Gerüstelement (21) herum liegen.
5. Gerüst nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Zwischenelement (30) an einem gegenüberliegenden, zweiten distalen äußeren Ende eine Gerüstkupplung aufweist und unter Zwischenschaltung derselben nicht-drehbar mit einem zweiten Gerüstelement gekoppelt ist.
6. Gerüst nach Anspruch 5, **dadurch gekennzeichnet, dass** das zweite Gerüstelement rohrförmig ist und die Gerüstkupplung eine Rohrschelle umfasst, die das zweite Gerüstelement klemmend umgreift.
7. Gerüst nach Anspruch 5, **dadurch gekennzeichnet, dass** die Gerüstkupplung einen Satz von zumindest im Wesentlichen parallelen Hakenelementen (32, 32) umfasst, die sich vom zweiten äußeren Ende des Zwischenelements (30) aus erstrecken und jeweils mit einer zumindest im Wesentlichen becherartigen Backe um das damit verbundene zweite Gerüstelement herum in Eingriff stehen, wobei die Hakenelemente (32, 32) zumindest im Wesentlichen dieselbe Ausrichtung haben, so dass die Backen um das zweite Gerüstelement herum von derselben Seite aus in Eingriff stehen, wobei ein Riegel vorgesehen ist, der das zweite Gerüstelement von einer gegenüberliegenden Seite aus nicht drehbar verriegelt.

Revendications

1. Échafaudage comprenant un système d'éléments d'échafaudage, composé des montants (10) et des longerons (20-22) qui s'étendent entre eux et sont couplés aux montants (10), et comprenant au moins un élément intermédiaire (30) qui permet de relier mutuellement un premier élément d'échafaudage (21) et un second élément d'échafaudage (22) au moins en grande partie le long d'une ligne perpendiculaire réciproque, l'élément intermédiaire (30) comprenant un corps allongé à partir duquel s'étend, à une extrémité extérieure distale, un ensemble de

- crochets (31, 32) au moins sensiblement parallèles, chacun ayant une mâchoire au moins sensiblement en forme de coupelle qui s'engage autour du premier élément d'échafaudage qui lui est relié, et les crochets (31, 32) ayant une orientation opposée de sorte que les mâchoires s'engagent autour du premier élément d'échafaudage (21) à partir de côtés opposés et permettent de maintenir une distance mutuelle supérieure à la distance entre les côtés opposés du premier élément d'échafaudage (21), les éléments de crochet (31, 32) étant sensiblement en forme de plaque, et l'élément intermédiaire (30) comprenant un corps en forme de conduit, **caractérisé par le fait que** lesdits éléments de crochet sensiblement en forme de plaque (31, 32) ont été au moins séparés d'une plaque, et **par le fait que** les éléments de crochet (31, 32) sont montés sur les flancs opposés de l'élément intermédiaire (30).
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2. Échafaudage selon la revendication 1, **caractérisé par le fait que** par une rotation de l'élément intermédiaire (30) autour de son axe, les éléments de crochet (32, 32) sont réglables entre une position dans laquelle ils s'engagent autour du premier élément d'échafaudage (21) et une position dans laquelle ils peuvent être libérés du premier élément d'échafaudage (21).
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3. Échafaudage selon la revendication 1 ou 2, **caractérisé par le fait que** le premier élément d'échafaudage (21) est tubulaire et que les éléments de crochet (32, 32) sont au moins de forme sensiblement identique et ont chacun une mâchoire sensiblement en forme de U.
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4. Échafaudage selon la revendication 1, 2 ou 3, **caractérisé par le fait que** les crochets (32, 32) entourent le premier élément d'échafaudage (21) au moins de manière à ce qu'ils s'adaptent sensiblement à la forme de l'échafaudage.
- 40
5. Échafaudage selon l'une ou plusieurs des revendications précédentes, **caractérisé par le fait que** l'élément intermédiaire (30) comprend, à une deuxième extrémité extérieure distale opposée, un accouplement d'échafaudage et, en l'interposant, est accouplé de manière non rotative à un deuxième élément d'échafaudage.
- 45
6. Échafaudage selon la revendication 5, **caractérisé par le fait que** le deuxième élément d'échafaudage est tubulaire et que l'accouplement d'échafaudage comprend une pince tubulaire qui s'engage par serrage autour du deuxième élément d'échafaudage.
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7. Échafaudage selon la revendication 5, **caractérisé par le fait que** l'accouplement d'échafaudage comprend un ensemble d'éléments de crochet (32,32)
- au moins sensiblement parallèles qui s'étendent à partir de la deuxième extrémité extérieure de l'élément intermédiaire (30) et s'engagent chacun dans une mâchoire au moins sensiblement en forme de coupelle autour du deuxième élément d'échafaudage qui lui est relié, les éléments de crochet (32,32) ayant au moins sensiblement la même orientation de sorte que les mâchoires s'engagent autour du deuxième élément d'échafaudage de manière non rotative à partir d'un côté opposé.

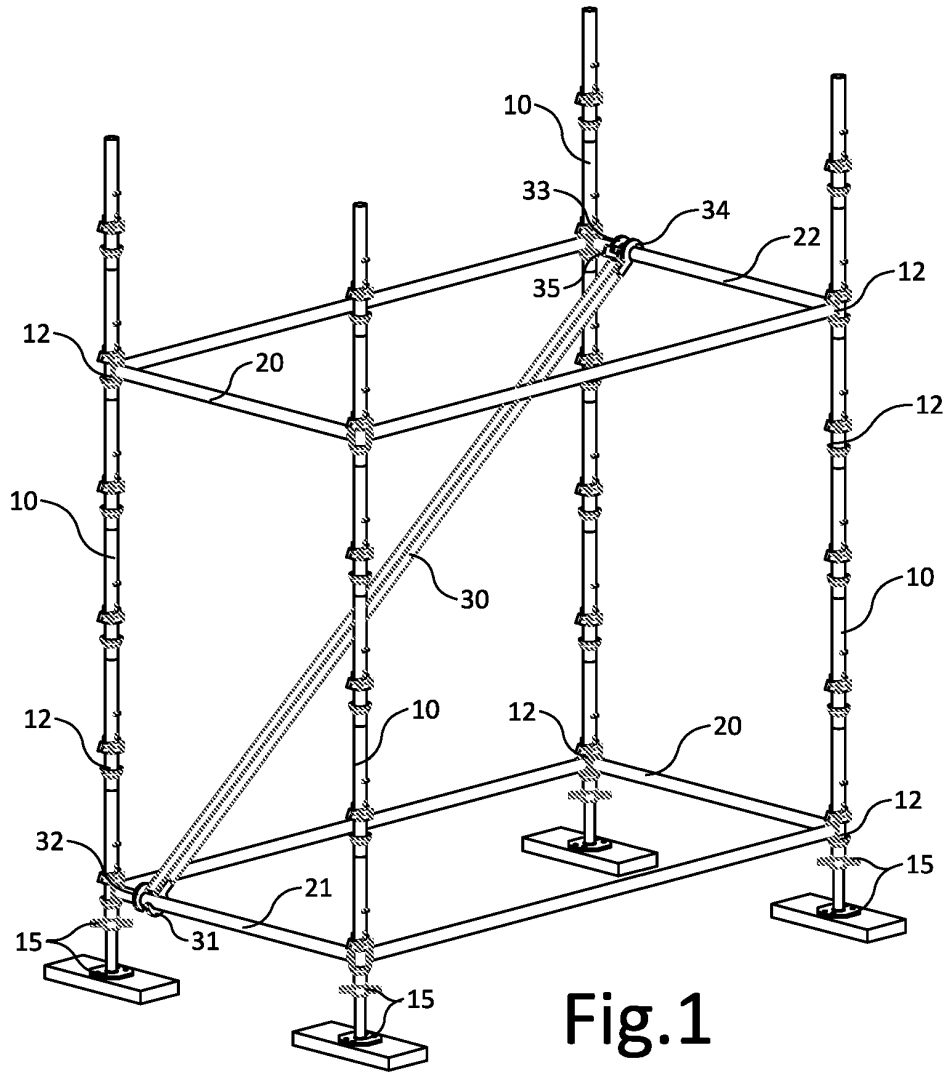


Fig.1

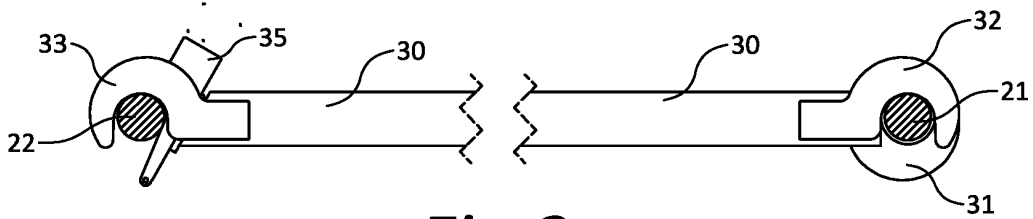


Fig.2

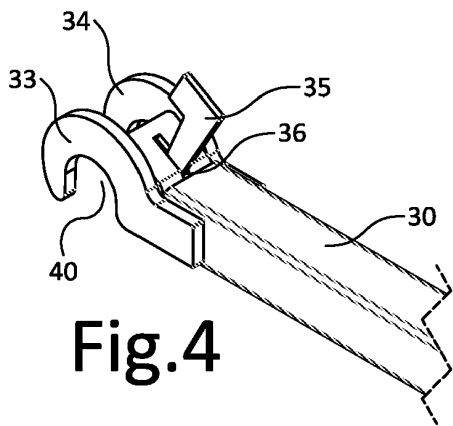


Fig.4

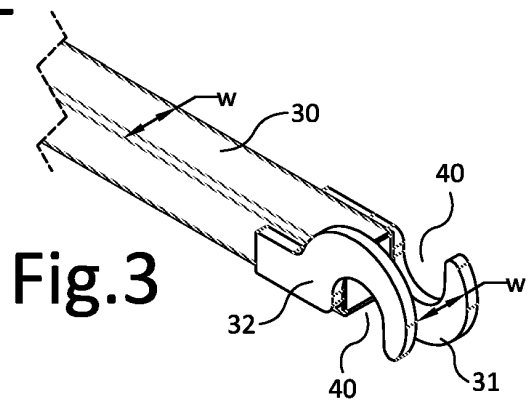


Fig.3

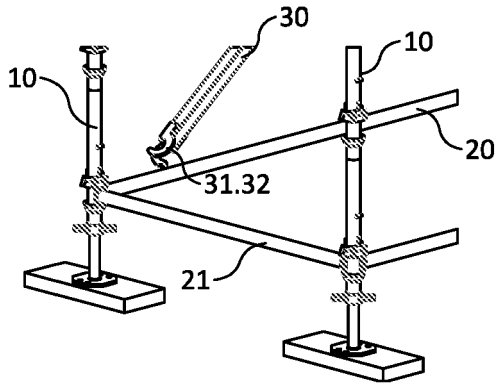


Fig.5A

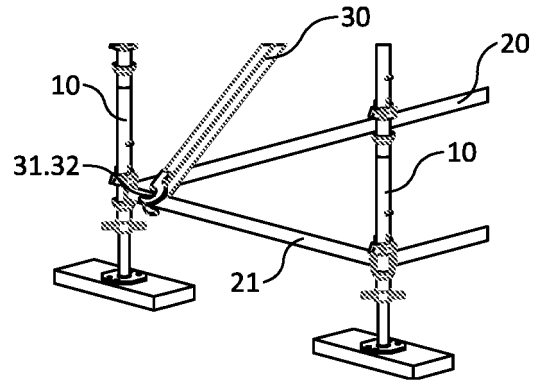


Fig.5B

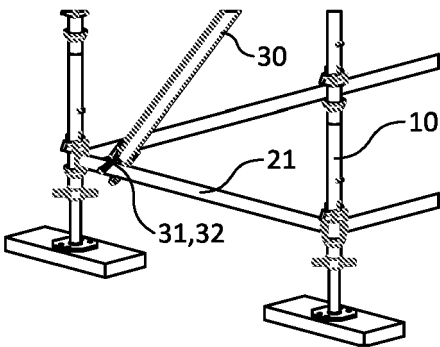


Fig.5C

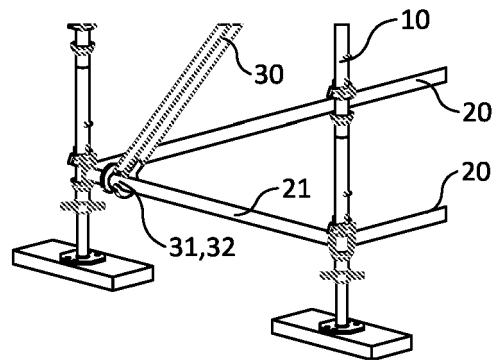


Fig.5D

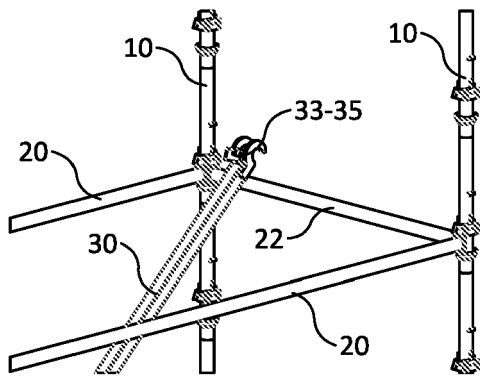


Fig.5E

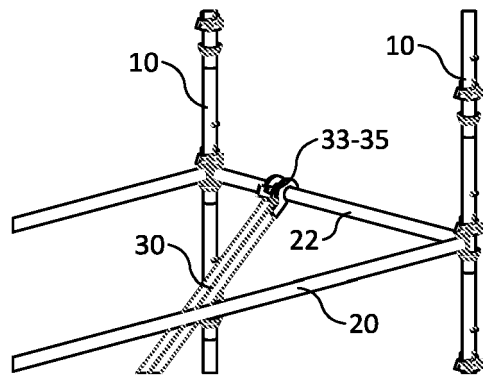


Fig.5F

REFERENCES CITED IN THE DESCRIPTION

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