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(54) **A BEARING STRUCTURE**

TRAGSTRUKTUR

STRUCTURE DE SUPPORT

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EP 3 225 746 B1

Description

[0001] The object of the present invention is a bearing structural system.

[0002] In particular, the object of the present invention is a bearing structural system for the building and construction industry.

[0003] A method of realization of a bearing structural system is also part of the invention.

[0004] The invention, with regard to elements constituting the system that have a larger dimension, is usefully used for example in all the buildings suitable for storage goods, motor vehicles and animals and more in general in all the buildings of an industrial, logistical and livestock nature.

[0005] The invention, with regard to elements constituting the system that have a smaller dimension, is usefully used for example in rows of poles (such as power lines and telephone lines and as in vineyards), in light structures (porticoes, awnings and small shelters) and more in general in all the buildings that are subject to moderate vertical and horizontal loads. Prefabricated elements are known such as foundation poles and micropoles that are suitable for consolidating unstable terrain or are suitable for carrying light loads if they are partially driven and partially emerging from the ground (e.g. vineyards, small porticoes and awnings). One type of indirect foundation that is often used in the building industry is in fact the so-called driven pile foundation.

[0006] This technology involves driving a reinforced concrete pole into the ground without removing earth, or without prior perforation and removal of earth, typically by hammering or applying static pressure.

[0007] The pole is driven into the terrain to a set depth below ground level (or the level of the reference excavation), said "driving depth" being measured as the distance between the lower tip (or the lower face) of the pole and ground level.

[0008] If the poles are used as an above ground load-bearing structure the technology can be particularly unstable and the load-bearing capacity is often compromised by terrain subsidence.

[0009] The use is also known of prefabricated or cast poles that are inserted into the seats of plinths with a pit or socket plinths realized as a foundation structure to support the pillars; generally, the former are more widely used more for poles of power or telephone lines whereas the latter are more widely used as vertical bearing structures of logistical buildings.

[0010] Plinths with pits or socket plinths are generally prefabricated and then cast on site within the foundation excavation thereof at a certain depth below ground level (or the reference excavation level), said "installing depth" being measured as the distance between the lower surface of the plinth and ground level; it is also usual to install the plinths on the resting surface provided by beds of reinforced concrete that are cast on site. Such systems according to the preamble of claim 1 are generally known, for instance from the document NL 9100680 A.

[0011] The two techniques presented nevertheless have numerous drawbacks. Firstly, if it is necessary to remove driven, intermediate or bored poles of large dimensions, the resulting operation is very laborious. Generally, deep excavations are carried out to reveal the entire pole and possible destruction involves chisels and other costly demolition methods. There is thus the drawback of the disposal of much building waste.

[0012] Micropoles are on the other hand easier to extract if they need to be removed because they are thinner. However, where they are also used as structural pillars they must above all be very deep to reach necessarily the most resistant substrates of terrain, often they are anyway surrounded by numerous other micropoles or piles (entirely buried) that help bear weight and are lastly often not able to ensure high vertical and horizontal load resistance: owing to the reduced cross section and accordingly the pronounced slenderness of the piles, they are less resistant and become unstable more easily and owing to their greater ability to penetrate the terrain they are more easily subject to short-term and long-term failure. Further, for installing socket plinths, significantly deep foundations are necessary, the use of which is clear from the need to anchor suitably the plinth to the installing terrain, or a suitable foundation concrete or lean concrete bed has to be provided by means of trenching or installing significant cubic metres of reinforced concrete, all of which tasks have to be performed on site. In both cases, it is moreover necessary to provide a layer of lean concrete before installing the socket plinths or the cast of the concrete bed

[0013] These constructional techniques have limits in terms of load-bearing capacity and removal operations that require very deep excavation with consequent movement of large quantities of terrain, both during construction and removal and in the phase of possible improvement or restoration of the site after removal.

[0014] The realization of a bearing structural system by driving poles or by installing socket plinths and poles thus has drawbacks linked to the stability of the structure, to the positioning of the poles and to the possible removal thereof, to the cost of driving the poles where they are numerous and/or with a great section, to the scale of the excavations during building, removal, improvement of the first site, to the costs of the lengthy building process.

[0015] In this context, the technical task of the present invention is to propose a bearing structural system and corresponding method of realization that overcome one or more of the drawbacks of the prior art quoted above.

[0016] In particular, the object of the present invention is to provide a bearing structural system that is structurally simple, versatile, of reduced dimensions, easy to install and easy to remove.

[0017] A further object of the present invention is to propose a bearing structural system that enables an excellent level of stiffness and structural stability to be ensured and enables the depth to which the poles are driven

to be modified easily.

[0018] The object of the present invention is further to provide a method for realizing a bearing structural system that is rapid, simple and improves the efficiency of the constructional process.

[0019] The stated technical task and specified objects are substantially achieved by a bearing structural system and a corresponding method of realization comprising the technical features disclosed in one or more of the appended claims.

[0020] In particular, this invention provides a bearing structural system according to claim 1 comprising inter alia a pole having a main extension axis and a foundation plinth comprising a housing seat that is suitable for receiving the pole.

[0021] The housing seat of the foundation plinth is a through seat and the pole is suitable for being arranged in the through housing seat in such a manner that, during a configuration of use of the bearing structural system, the pole can be arranged at a set driving depth that is less than an installation depth of the foundation plinth.

[0022] Advantageously, having a foundation plinth that is bored around the pole, i.e. owing to the presence of the through housing seat, it is possible to keep the pole in position once it is driven into the terrain.

[0023] Further, advantageously owing to the present invention the pole can be driven into the terrain by the desired length without the need to have to arrange previously a foundation plinth.

[0024] A further advantage of the present invention is of exploiting together the terrain-compacting capacity of a traditional driven pole with the foundation stability capacity of the foundation plinth of which the pole is traditionally bereft.

[0025] Further, advantageously according to the present invention, by exploiting the capacity of the foundation plinth to distribute the loads over a larger surface than merely the section of the pole, reaching great depths in the terrain becomes superfluous.

[0026] Advantageously, owing to the present invention the coaction of pole and foundation plinth reduces the need for a great number of driven poles, further lowering costs.

[0027] The present invention further provides a method according to claim 8 for realizing a bearing structural system comprising inter alia the steps of:

- providing a pole,
- inserting pole into the terrain to a set driving depth,
- providing a foundation plinth comprising a through housing seat and suitable for receiving the pole,
- arranging the pole passing through the housing seat of the foundation plinth,
- arranging the foundation plinth at an installation depth that is greater than the driving depth.

[0028] Advantageously, the disclosed method enables a bearing structural system to be realized rapidly.

[0029] Owing to this method, it is possible to reinforce structurally a pole driven into the terrain in order to be able to use it as a bearing structure.

[0030] The appended claims, included here for reference, correspond to different embodiments of the invention.

[0031] Further characteristics and advantages of the present invention will become more apparent from the following illustrative, and hence nonlimiting, description of a preferred, but not exclusive, embodiment of a bearing structural system, as illustrated in the appended drawings, in which:

- figure 1 is a schematic perspective view of a bearing structural system according to one possible embodiment of the present invention during a step of positioning the foundation plinth,
- figure 2 is a detailed schematic prospective view of the bearing structural system of figure 1 during a step of assembling the anchoring element,
- figure 3 is a detailed schematic prospective view of the bearing structural system of figure 1 during a further step of assembling the anchoring element,
- figure 4 is a detailed schematic prospective view of the bearing structural system of figure 1 during a step of installing clamping means,
- figure 5 is a detailed schematic prospective view of the bearing structural system of figure 1 during a step of assembling the closing element of the anchoring element, and
- figure 6 is a partially sectioned schematic side view of the system of figure 1 at the end of the steps of realizing the system.

[0032] With reference to the appended figures, with 1 overall a bearing structural system, has been indicated that from now on is simply system 1.

[0033] The system 1 comprises a pole 2 having a main extension axis X. Preferably, the pole 2 can be made of one of the following materials: reinforced concrete (R.C.), prestressed reinforced concrete (P. R. C.), steel, wood.

[0034] Preferably, the pole 2 has a polygonal section, still more preferably a square or rectangular section.

[0035] The system 1 comprises a foundation plinth 3 comprising a housing seat 4 that is suitable for receiving the pole 2.

[0036] Advantageously, the housing seat 4 of the foundation plinth 3 is a through seat and the pole 2 is suitable for being arranged in the through housing seat 4 in such a manner that, during a configuration of use of the system 1, the pole 2 can be arranged at a set driving depth "h" that is less than an installation depth "H" of the foundation plinth, as illustrated in figure 6.

[0037] In other terms, the through housing seat 4 has a shape and dimensions that are such as to enable the pole 2 to slide in the interior thereof.

[0038] Still more preferably the housing seat 4 has a countersink 4a to the centre, as visible in figure 2.

[0039] Preferably, the foundation plinth 3 coated with a waterproofing sheath.

[0040] Preferably, the foundation plinth 3 is provided with positioning rings 5 that are integral with the foundation plinth 3 itself and are configured for being connected by chains or hooks by lifting means, which is not illustrated in the appended figures, to handle the foundation plinth 3.

[0041] Preferably, the foundation plinth 3 comprises a plurality of feet arranged in the lower surface of the foundation plinth 3, which are not illustrated in the appended figures, which are even more preferably made as one piece with the foundation plinth 3. Advantageously, the feet act as spacer elements favouring possible stacking of several foundation plinths 3 during the conveying step, thus safeguarding the structural integrity of the foundation plinths 3.

[0042] With reference to figures 2-5, the system 1 preferably comprises at least one anchoring element 6 configured for anchoring the pole 2 with the foundation plinth 3.

[0043] Preferably, the anchoring element 6 comprises a first anchoring portion 7 configured for engaging with the foundation plinth 3 and a second anchoring portion 8 configured for engaging with the pole 2.

[0044] Preferably, the first and/or the second anchoring portion 7, 8 are made of steel.

[0045] In a possible embodiment of the anchoring element 6, which is not illustrated in the attached figures, preferably the first and second anchoring portion 7, 8 are afforded in a piece.

[0046] Preferably, the anchoring element 6 is substantially L-shaped.

[0047] Preferably, the pole 2 has a plurality of recesses 9 on at least one face 2a of the lateral external surface of the pole 2.

[0048] With reference to figure 2, preferably the second anchoring portion 8 has a plurality of protrusions 10 conformed in such a manner as to be coupled respectively with the plurality of recesses 9 for anchoring the second anchoring portion 8 to the pole 2.

[0049] Preferably, the recesses 9 are protected inside with rubber plug elements (or another material of similar consistency, resilience and section modulus), which are not illustrated, to prevent direct contact between the recesses 9 and the protrusions 10. Advantageously, in this manner the exchange of forces between the recesses 9 and the protrusions 10 is ensured.

[0050] Advantageously, owing to the presence of the recesses 9, it is possible to have a continuous and precise reference for anchoring the pole 2 to the foundation plinth 3, regardless of the driving depth of the pole 2. Advantageously, the recesses 9 are configured for increasing the grip of the pole 2 with the terrain.

[0051] Preferably, in the case of poles 2 made by precompression with pretensioned cables (thus subject to shortening after the release of the pretensioning cables that, although very small and much less than the entire length of the element along the main axis x thereof, can act on the position of the recesses 9, which can move during the shortening step), the recesses 9 are made with dimensions slightly greater than the protrusions 10; in this manner, a certain clearance is ensured that can facilitate correct positioning of the second anchoring portion 8.

[0052] Preferably, the first anchoring portion 7 can be anchored to the foundation plinth 3 by first fixing elements 7a.

[0053] Even more preferably, the first fixing elements 7a pass the upper surface 3a of the foundation plinth 3 and the first anchoring portion 7.

[0054] Even more preferably the first fixing elements 7a pass the countersink 4a of the foundation plinth 3 and the first anchoring portion 7.

[0055] Preferably, the system 1 that is the object of the present invention comprises at least one pair of anchoring elements 6 that are arranged opposite the pole 2, even more preferably two pairs of anchoring elements 6, as illustrated in the appended figures 2-5.

[0056] With reference to figure 4, the system 1 preferably comprises clamping means 11 to claim the pairs of anchoring elements 6 together. Advantageously, by making the opposite anchoring elements 6 integral, the clamping means 11 permits greater stability and solidity in the system 1.

[0057] Still more preferably, the clamping means 11 comprises bars 12 (for example of steel and threaded items) that are insertable into gripping slots 13 of the anchoring elements 6 and are clampable to the ends with clamping elements 14 (for example nuts).

[0058] It should be noted how advantageously clamping does not affect the integrity of the pole 2, remaining outside the pole 2.

[0059] If for design requirements or if the pole 2 has a bulky section, external clamping by bars 12 can be implemented or replaced, if overall dimensions are excessive, with a different solution.

[0060] Preferably in fact, the system 1 comprises a plurality of fixing pins, which are not illustrated in the appended figures, which are suitable for being inserted into the pole 2 and passing respectively inside a plurality of holes 15 made in the second anchoring portion 8, illustrated in figure 2.

[0061] The pins enable the second anchoring portion 8 to be fixed to the pole 2 without encroaching on the volume surrounding the anchoring portion 8. Preferably, holes are made (for example by drill) inside the pole 2, which are not illustrated in the appended figures, which are filled with thermosetting resin (for example epoxy resin), that following the insertion of the through pins first in the holes 15 and then in the holes of the pole 2, makes the pins integral with the pole 2.

[0062] With reference to figure 3, the system 1 preferably comprises at least one reinforcing plate 16 suitable for being arranged between the first anchoring portion 7 and the second anchoring portion 8 perpendicularly to

the face 2a of the lateral external surface of the pole 2 and parallel to the main extension direction X of the pole 2.

[0063] With reference to figures 2 and 3, preferably it is possible to exploit a clearance space between the outer side surface 2a of the pole 2 and the inner surface of the housing seat 4 of the foundation plinth 3 to insert insulating materials (for example foam injections) to protect the anchoring elements 6 from the capillary nature of the underground fluids.

[0064] With reference to figure 5, the system 1 preferably comprises at least one closing element 17 for closing the anchoring element 6.

[0065] Still more preferably, the closing element 17 is made of plastic and is suitably shaped to be restrained by pressure on the anchoring elements 6. According to a further aspect of the invention, a method is provided for realizing a system 1 comprising the steps of:

- providing a pole 2,
- inserting the pole 2 into the terrain T to a set driving depth "h",
- providing the foundation plinth 3,
- arranging the pole 2 passing through the through housing seat 4 of the foundation plinth 3,
- arranging the foundation plinth 3 at an installation depth "H" that is greater than the driving depth "h" of the pole 2.

[0066] Advantageously, the fact of being able to insert the through pole 2 inside the foundation plinth 3 enables a structure 1 to be obtained that has great stability features.

[0067] Depending on the driving depth of the pole 2, it is possible to realize versatile structures 1 that are able to adapt to the geotechnical features of the terrain T and owing to the presence of the foundation plinth 3 it is possible to have excellent stability and bearing features.

[0068] Preferably, as illustrated in figure 1, the step of arranging the through pole 2 for the through housing seat 4 comprises the subphase of lowering from above the foundation plinth 3 on the pole 2.

[0069] If the foundation plinth 3, for different design needs, is not intended to be installed at ground level, the method can comprise the subphase of making a small foundation excavation S around the pole 2, which can be achieved for example with small excavating machine, the excavation S being suitable for housing the foundation plinth 3.

[0070] It is nevertheless also possible to position the foundation plinth 3 in a suitable excavation S before driving the pole 2.

[0071] Once the foundation plinth 3 and the pole 2 have been positioned and properly settled in the terrain T, in order to improve the stability of the system 1, it is possible to proceed with anchoring the two elements.

[0072] In this connection, with reference to figures 2-4, preferably the method comprises the step of anchoring the pole 2 to the foundation plinth 3.

[0073] In figure 2 a step is illustrated of fitting the second anchoring portions 8 that can be advantageously mounted at the desired depth on the basis of the geometrical positioning diagram of the recesses 9 on the pole 2.

[0074] In figure 3, a step of fitting the first anchoring portions 7 is illustrated, which can be reinforced by the reinforcing plates 16.

[0075] With reference to figure 4, once the first anchoring portions 7 are fixed to the foundation plinth 3 and the second anchoring portions 8 are fixed to the pole 2, it is possible to clamp the closing elements 6 by the clamping means 11, so as to make the pole 2- foundation plinth 3 system more stable.

[0076] In figure 5 a final step is illustrated of the method of realizing the system 1 that installs the closing elements 17, owing to which it is possible to protect the closing elements 6 from external agents.

[0077] Advantageously, owing to the present invention the pole 2 acts both as a foundation pole, in as much as it is partially underground, and acts as a consolidating pole when it is driven, and acts as a pillar of the building or of the lines (e.g. power and telephone); this element, near ground level, is anchored to a foundation plinth 3 that acts as a stiff confining ring minimizing the horizontal and vertical movements of the vertical bearing element (pole 2) that it controls, with excellent results in antiseismic terms. Further, adopting horizontal and/or vertical bracing portals, which are not illustrated in the appended figures, which are applied to the above-ground portion of the bearing vertical elements (i.e. of the portion of the poles 2 that protrudes from the terrain) in buildings realized with the technique presented in this invention, contributes significantly to the building achieving the behaviour of an entire stiff body that useful for antiseismic purposes.

[0078] Owing to the coaction of the burying of the pole 2 and the distribution of force provided by the foundation plinth 3, another advantage of the system 1 depends on the fact that the pole 2 can be driven, inserted or installed at lower depths than that of the foundation poles or the consolidating micropoles, so that the pole 2 is more easily extractable in the event of possible removal, without the use of particularly powerful machines, and with a lower environmental impact. The coaction of a vertical element (pole 2) and "ring-shaped plinth" (foundation plinth 3) makes the system 1 much stiffer than traditional techniques (simple installation of plinths or another foundation on the poles or on the micropoles); this enables greater performance to be achieved with thinner elements with savings of costs of materials.

[0079] This is further a solution that is completely prefabricatable, assemblable, modular and modulable, assemblable and dismantlable on site, adjustable to the different geomorphological needs of the installation and driving terrain; a solution that involves very slight excavation if any and is above all more easily removable and

has virtually zero environmental impact; a solution that it is possible to reuse in another place and which permits improvement and restoration of the first site quickly and with little labour, it is thus also cheap.

[0080] The total assemblability of the system, speeds up building operations enormously, reducing labour costs enormously.

[0081] This invention achieves the proposed objects by overcoming the prior-art drawbacks complained about and making available a bearing structural system and a corresponding realization method that combines the advantages of the speed of prefabricated building, the advantages of simplicity of installation that characterizes "pillar-socket plinth" systems, with the advantages of compacting the terrain that is characteristic of driven poles and micropoles.

Claims

1. A bearing structural system (1) comprising a pole (2) having a main extension axis (X) and a foundation plinth (3) comprising a seat for the housing (4) which is suitable for receiving said pole (2), said seat for the housing (4) of the foundation plinth (3) is passing through and that said pole (2) is adapted for being arranged within said through seat for the housing (4) so that, during a configuration of use of the bearing structural system (1), said pole (2) can be placed at a certain driving depth (h) lower than an installation depth (H) of said foundation plinth (3); **characterized in that** said bearing structural system (1) comprising:

   - at least a pair of anchoring elements (6) arranged opposite with respect to said pole (2), preferably two pairs of anchoring elements (6), each anchoring element (6) being configured for anchoring said pole (2) with said foundation plinth (3), each anchoring element (6) comprising respectively a first anchoring portion (7) configured to engage with the foundation plinth (3) and a second anchoring portion (8) configured to engage with said pole (2); and
   - clamping means (11) for clamping one to another the at least one pair of anchoring elements (6), wherein said clamping means (11) comprises bars (12) insertable into gripping slots (13) of said anchoring elements (6), said bars (12) being clamped at the ends thereof with clamping elements (14).

2. A bearing structural system (1) according to claim 1, wherein said pole (2) exhibits a plurality of recesses (9) on at least one face (2a) of the outer side surface of the pole (2) and wherein said second anchoring portion (8) exhibits a plurality of protrusions (10), which are so shaped as to match respectively with said plurality of recesses (9) in order that said second anchoring portion (8) is anchored to said pole (2).

3. A bearing structural system (1) according to claim 1 or 2, wherein said first and second anchoring portion (7, 8) are afforded in a single piece.

4. A bearing structural system (1) according to any of the preceding claims comprising a plurality of fixing pins adapted to be inserted into the pole (2) and passing respectively through a plurality of holes (15) which are afforded in the second anchoring portion (8).

5. A bearing structural system (1) according to any of the preceding claims comprising at least one reinforcing plate (16) adapted to be arranged between the first anchoring portion (7) and the second anchoring portion (8) perpendicular to said at least one face (2a) of the outer side surface of the pole (2) and parallel to the main extension direction (X) of the pole (2).

6. A bearing structural system (1) according to any of the preceding claims comprising at least one closing element (17) of the anchoring element (6).

7. A bearing structural system (1) according to any one of claims 1 to 6, wherein said at least one anchoring element (6) is substantially "L"-shaped.

8. A method for realizing a bearing structural system (1) comprising the steps of:

   - preparing a pole (2),
   - inserting said pole (2) into the ground (T) at a certain driving depth (h),
   - preparing a foundation plinth (3) comprising a through seat for the housing (4) suitable for receiving said passing through pole (2),
   - arranging said pole (2) which is passing through said through housing (4),
   - arranging said foundation plinth (3) at an installation depth (H) greater than said driving depth (h) of the pole (2);
   - anchoring said pole (2) to said foundation plinth (3) by providing at least a pair of anchoring elements (6) arranged opposite with respect to said pole (2), preferably two pairs of anchoring elements (6); said anchoring step comprising a sub-step of engaging respective first anchoring portions (7) of the anchoring elements (6) with the foundation plinth (3) and a sub-step of engaging respective second anchoring portions (8) of the anchoring elements (6) with said pole (2);
   - clamping one to another the at least one pair of anchoring elements (6) by inserting bars (12) into gripping slots (13) of said anchoring elements (6) and clamping said bars (12) at the

ends thereof with clamping elements (14).

9. A method for realizing a bearing structural system (1) according to claim 8, wherein said step of arranging said pole (2) passing through said through seat for the housing (4) comprises the sub-step of lowering said foundation plinth (3) from top to bottom onto the pole (2).

Patentansprüche

1. Tragendes Struktursystem (1) mit einem Pfeiler (2), der eine Haupterstreckungsachse (X) aufweist, und einem Fundamentsockel (3), der einen Sitz für das Gehäuse (4) aufweist, der zur Aufnahme des Pfeilers (2) geeignet ist, der Sitz für das Gehäuse (4) des Fundamentsockels (3) durchgehend ist und der Pfeiler (2) ausgebildet ist, innerhalb des durchgehenden Sitzes für das Gehäuse (4) angeordnet zu werden, so dass der Pfeiler (2) während einer Verwendungskonfiguration des tragenden Struktursystems (1) in einer bestimmten Eindringtiefe (h) platziert werden kann, die niedriger ist als eine Installationstiefe (H) des Fundamentsockels (3), **dadurch gekennzeichnet, dass** das tragende Struktursystem (1) umfasst:

- mindestens ein Paar von Verankerungselementen (6), die in Bezug auf den Pfeiler (2) gegenüberliegend angeordnet sind, vorzugsweise zwei Paare von Verankerungselementen (6), wobei jedes Verankerungselement (6) so konfiguriert ist, dass es den Pfeiler (2) mit dem Fundamentsockel (3) verankert, wobei jedes Verankerungselement (6) jeweils einen ersten Verankerungsabschnitt (7) umfasst, der konfiguriert ist, dass er mit dem Fundamentsockel (3) in Eingriff tritt, und einen zweiten Verankerungsabschnitt (8), der konfiguriert ist, dass er mit dem Pfeiler (2) in Eingriff tritt; und
- eine Klemmeinrichtung (11) zum Festklemmen des mindestens einen Paares von Verankerungselementen (6) eines gegen ein anderes, wobei die Klemmeinrichtung (11) Stangen (12) umfasst, die in Greifschlitze (13) der Verankerungselemente (6) einsetzbar sind, wobei die Stangen (12) an ihren Enden mit Klemmelementen (14) festgeklemmt sind.

2. Tragendes Struktursystem (1) nach Anspruch 1, wobei der Pfeiler (2) eine Vielzahl von Ausnehmungen (9) auf mindestens einer Seite (2a) der äußeren Seitenfläche des Pfeilers (2) aufweist und wobei der zweite Verankerungsabschnitt (8) eine Vielzahl von Vorsprüngen (10) aufweist, die so geformt sind, dass sie jeweils der Vielzahl von Ausnehmungen (9) entsprechen, damit der zweite Verankerungsabschnitt (8) an dem Pfeiler (2) verankert wird.

3. Tragendes Struktursystem (1) nach Anspruch 1 oder 2, wobei der erste und der zweite Verankerungsabschnitt (7, 8) aus einem einzigen Teil bestehen.

4. Tragendes Struktursystem (1) nach einem der vorhergehenden Ansprüche, umfassend eine Vielzahl von Befestigungsstiften, die ausgebildet sind, in den Pfeiler (2) eingeführt zu werden und jeweils durch eine Vielzahl von Löchern (15) führen, die in dem zweiten Verankerungsabschnitt (8) ausgebildet sind.

5. Tragendes Struktursystem (1) nach einem der vorhergehenden Ansprüche, umfassend mindestens einer Verstärkungsplatte (16), die ausgebildet ist, zwischen dem ersten Verankerungsabschnitt (7) und dem zweiten Verankerungsabschnitt (8) senkrecht zu der mindestens einen Seite (2a) der äußeren Seitenfläche des Pfeilers (2) und parallel zu der Haupterstreckungsrichtung (X) des Pfeilers (2) angeordnet zu werden.

6. Tragendes Struktursystem (1) nach einem der vorhergehenden Ansprüche, umfassend mindestens ein Verschlusselement (17) des Verankerungselements (6).

7. Tragendes Struktursystem (1) nach einem der Ansprüche 1 bis 6, wobei das mindestens eine Verankerungselement (6) im Wesentlichen "L"-förmig ist.

8. Verfahren zur Herstellung eines tragenden Struktursystems (1) umfassend die nachfolgenden Schritte:

- Vorbereiten eines Pfeilers (2),
- Einsetzen des Pfeilers (2) in den Boden (T) mit einer bestimmten Eindringtiefe (h),
- Vorbereiten eines Fundamentsockels (3) mit einem durchgehenden Sitz für das Gehäuse (4), der zur Aufnahme des durchgehenden Pfeilers (2) geeignet ist,
- Anordnen des Pfeilers (2), der durch das durchgehende Gehäuse (4) hindurchgeht,
- Anordnen des Fundamentsockels (3) in einer Einbautiefe (H), die größer ist als die Eindringtiefe (h) des Pfeilers (2);
- Verankern des Pfeilers (2) an dem Fundamentsockel (3) durch Bereitstellen von mindestens einem Paar von Verankerungselementen (6), die in Bezug auf den Pfeiler (2) gegenüberliegend angeordnet sind, vorzugsweise zwei Paaren von Verankerungselementen (6); wobei der Verankerungsschritt einen Teilschritt des Verankerns jeweiliger erster Verankerungsabschnitte (7) der Verankerungselemente (6) mit dem Fundamentsockel (3) und einen Teilschritt des Verankerns jeweiliger zweiter Verankerungsabschnitte (8) der Verankerungselemente

(6) mit dem Pfeiler (2) umfasst;
- Festklemmen des mindestens einen Paares von Verankerungselementen (6) eines gegen ein anderes durch Einführen von Stangen (12) in Greifschlitze (13) der Verankerungselemente (6) und Festklemmen der Stangen (12) an ihren Enden mit Klemmelementen (14).

9. Verfahren zur Realisierung eines tragenden Struktursystems (1) nach Anspruch 8, wobei der Schritt des Anordnens des Pfeilers (2), der durch den durchgehenden Sitz für das Gehäuse (4) hindurchgeht, den Teilschritt des Absenkens des Fundamentsockels (3) von oben nach unten auf den Pfeiler (2) umfasst.

Revendications

1. Système structurel porteur (1) comprenant un poteau (2) ayant un axe d'extension principal (X) et un soubassement de fondation (3) comprenant une assise pour le logement (4) qui est appropriée pour recevoir ledit poteau (2), ladite assise pour le logement (4) du soubassement de fondation (3) est traversante et ledit poteau (2) est adapté pour être agencé au sein de ladite assise traversante pour le logement (4) de sorte que, pendant une configuration d'utilisation du système structurel porteur (1), ledit poteau (2) puisse être placé à une certaine profondeur d'entraînement (h) inférieure à une profondeur d'installation (H) dudit soubassement de fondation (3) ; **caractérisé en ce que** ledit système structurel porteur (1) comprend :

- au moins une paire d'éléments d'ancrage (6) agencés à l'opposé par rapport audit poteau (2), de préférence deux paires d'éléments d'ancrage (6), chaque élément d'ancrage (6) étant configuré pour ancrer ledit poteau (2) avec ledit soubassement de fondation (3), chaque élément d'ancrage (6) comprenant respectivement une première portion d'ancrage (7) configurée pour s'engager avec le soubassement de fondation (3) et une seconde portion d'ancrage (8) configurée pour s'engager avec ledit poteau (2) ; et
- un moyen de serrage (11) pour serrer l'un sur l'autre l'au moins une paire d'éléments d'ancrage (6), dans lequel ledit moyen de serrage (11) comprend des barres (12) pouvant être insérées dans des fentes de préhension (13) desdits éléments d'ancrage (6), lesdites barres (12) étant serrées à leurs extrémités avec des éléments de serrage (14).

2. Système structurel porteur (1) selon la revendication 1, dans lequel ledit poteau (2) présente une pluralité d'évidements (9) sur au moins une face (2a) de la surface de côté externe du poteau (2) et dans lequel ladite seconde portion d'ancrage (8) présente une pluralité de protubérances (10), qui sont ainsi formées de façon à concorder respectivement avec ladite pluralité d'évidements (9) afin que ladite seconde portion d'ancrage (8) soit ancrée sur ledit poteau (2).

3. Système structurel porteur (1) selon la revendication 1 ou 2, dans lequel lesdites première et seconde portions d'ancrage (7, 8) sont prévues d'une seule pièce.

4. Système structurel porteur (1) selon l'une quelconque des revendications précédentes, comprenant une pluralité de broches de fixation adaptées pour être insérées dans le poteau (2) et passant respectivement à travers une pluralité de trous (15) qui sont prévus dans la seconde portion d'ancrage (8).

5. Système structurel porteur (1) selon l'une quelconque des revendications précédentes, comprenant au moins une plaque de renfort (16) adaptée pour être agencée entre la première portion d'ancrage (7) et la seconde portion d'ancrage (8) perpendiculairement à ladite au moins une face (2a) de la surface de côté externe du poteau (2) et parallèlement à la direction d'extension principale (X) du poteau (2).

6. Système structurel porteur (1) selon l'une quelconque des revendications précédentes, comprenant au moins un élément de fermeture (17) de l'élément d'ancrage (6).

7. Système structurel porteur (1) selon l'une quelconque des revendications 1 à 6, dans lequel ledit au moins un élément d'ancrage (6) est sensiblement en forme de « L ».

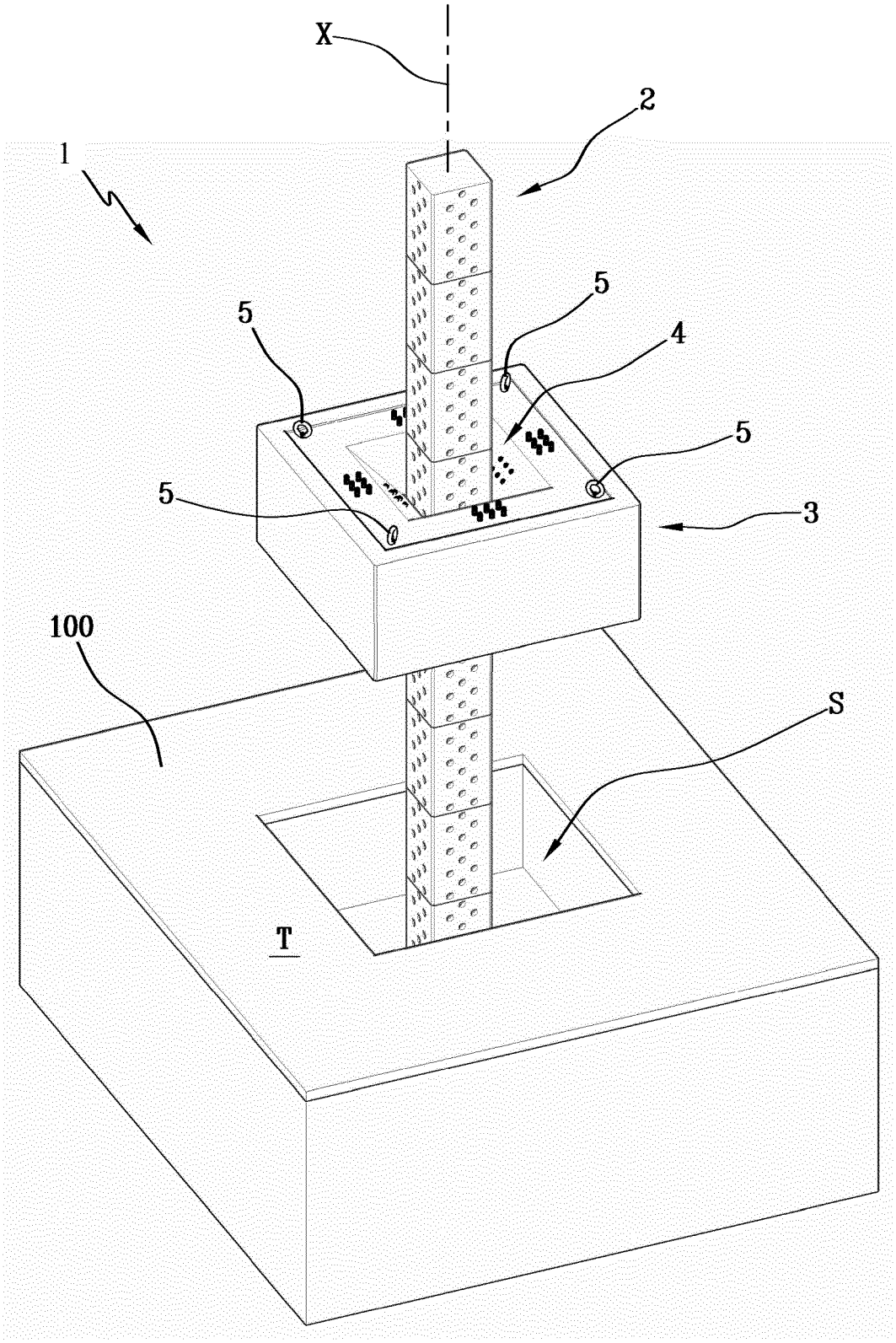
8. Procédé de réalisation d'un système structurel porteur (1) comprenant les étapes de :

- préparation d'un poteau (2),
- insertion dudit poteau (2) dans le sol (T) à une certaine profondeur d'entraînement (h),
- préparation d'un soubassement de fondation (3) comprenant une assise traversante pour le logement (4) appropriée pour recevoir ledit poteau (2) traversant,
- agencement dudit poteau (2) qui passe à travers ledit logement (4) traversant,
- agencement dudit soubassement de fondation (3) à une profondeur d'installation (H) supérieure à ladite profondeur d'entraînement (h) du poteau (2) ;
- ancrage dudit poteau (2) sur ledit soubassement de fondation (3) en fournissant au moins une paire d'éléments d'ancrage (6) agencés à

l'opposé par rapport audit poteau (2), de préférence deux paires d'éléments d'ancrage (6) ; ladite étape d'ancrage comprenant une sous-étape d'engagement de premières portions d'ancrage (7) respectives des éléments d'ancrage (6) avec le soubassement de fondation (3) et une sous-étape d'engagement de secondes portions d'ancrage (8) respectives des éléments d'ancrage (6) avec ledit poteau (2) ;
- serrage l'un sur l'autre de l'au moins une paire d'éléments d'ancrage (6) en insérant des barres (12) dans des fentes de préhension (13) desdits éléments d'ancrage (6) et en serrant lesdites barres (12) à leurs extrémités avec des éléments de serrage (14).

9. Procédé de réalisation d'un système structurel porteur (1) selon la revendication 8, dans lequel ladite étape d'agencement dudit poteau (2) passant à travers ladite assise traversante pour le logement (4) comprend la sous-étape de descente dudit soubassement de fondation (3) de haut en bas sur le poteau (2).

Fig.1



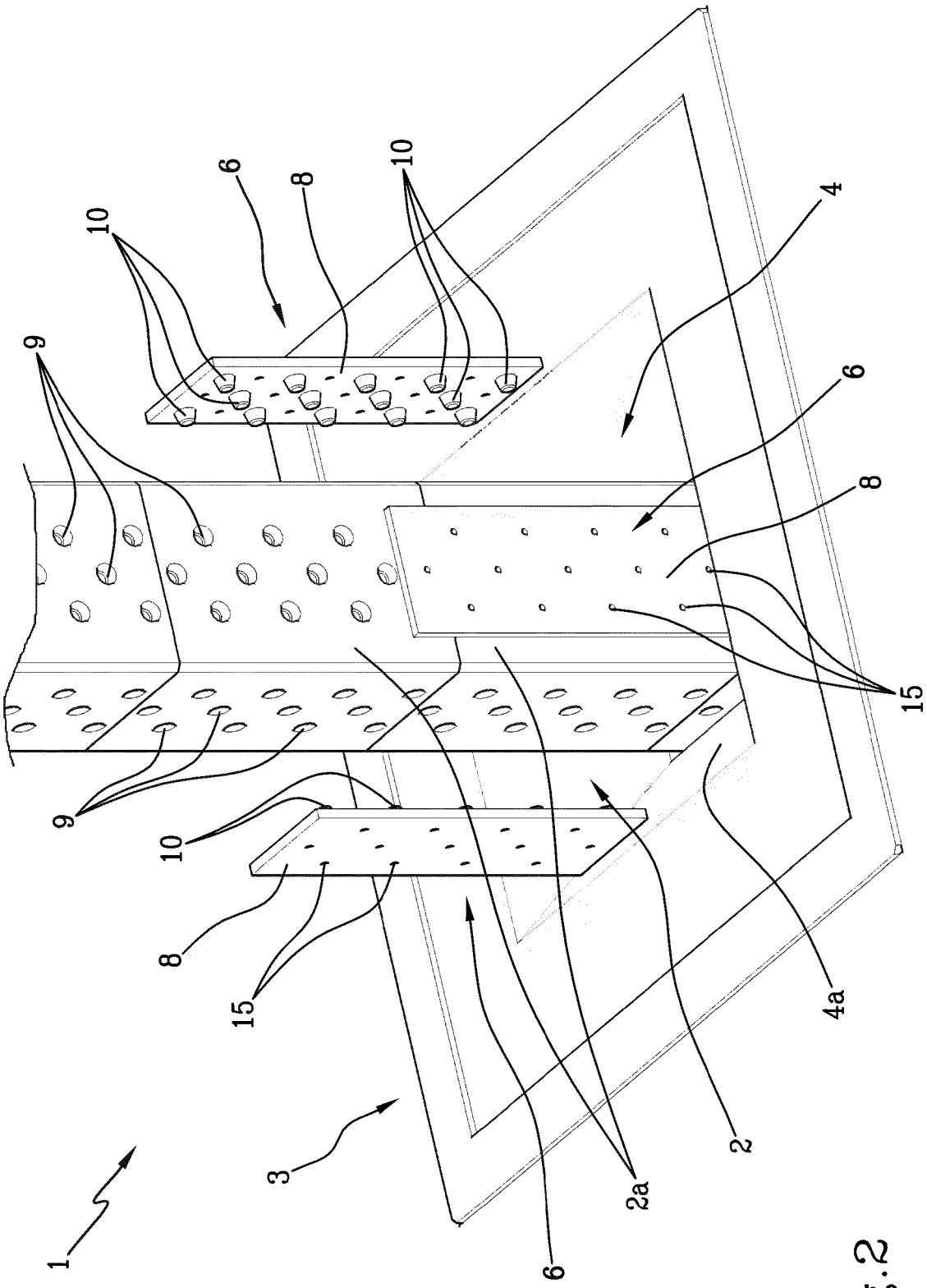


Fig.2

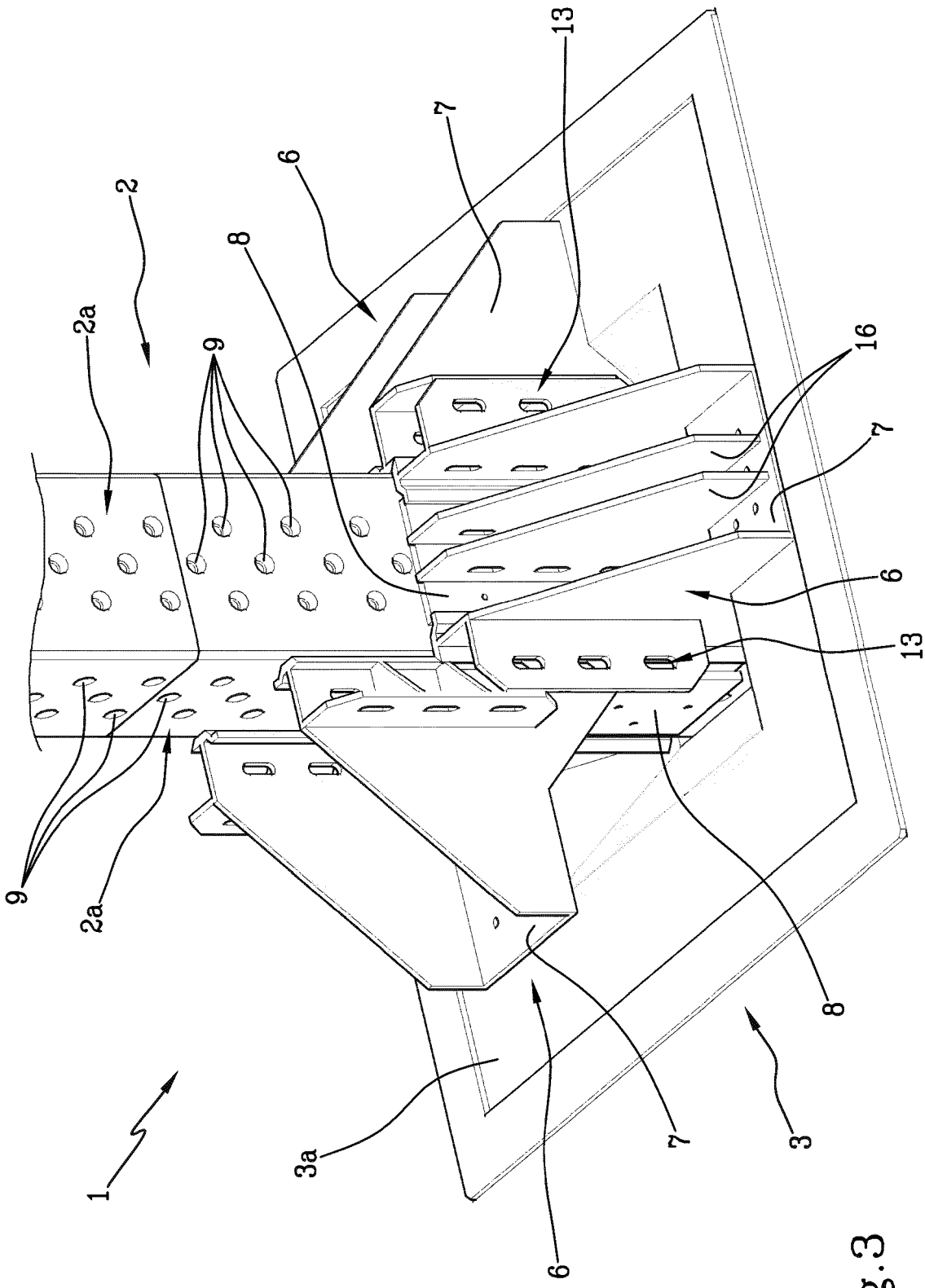


Fig.3

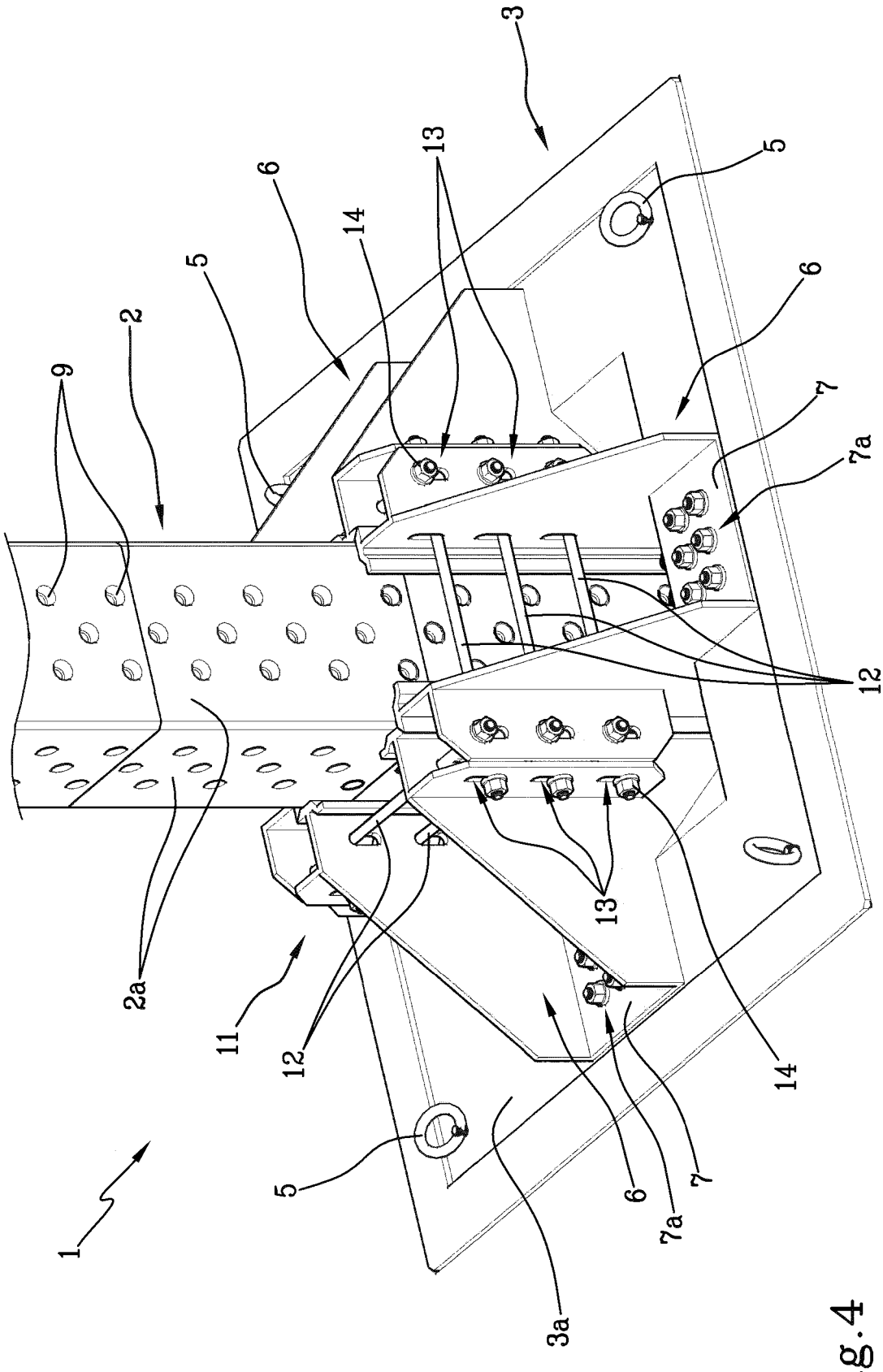


Fig.4

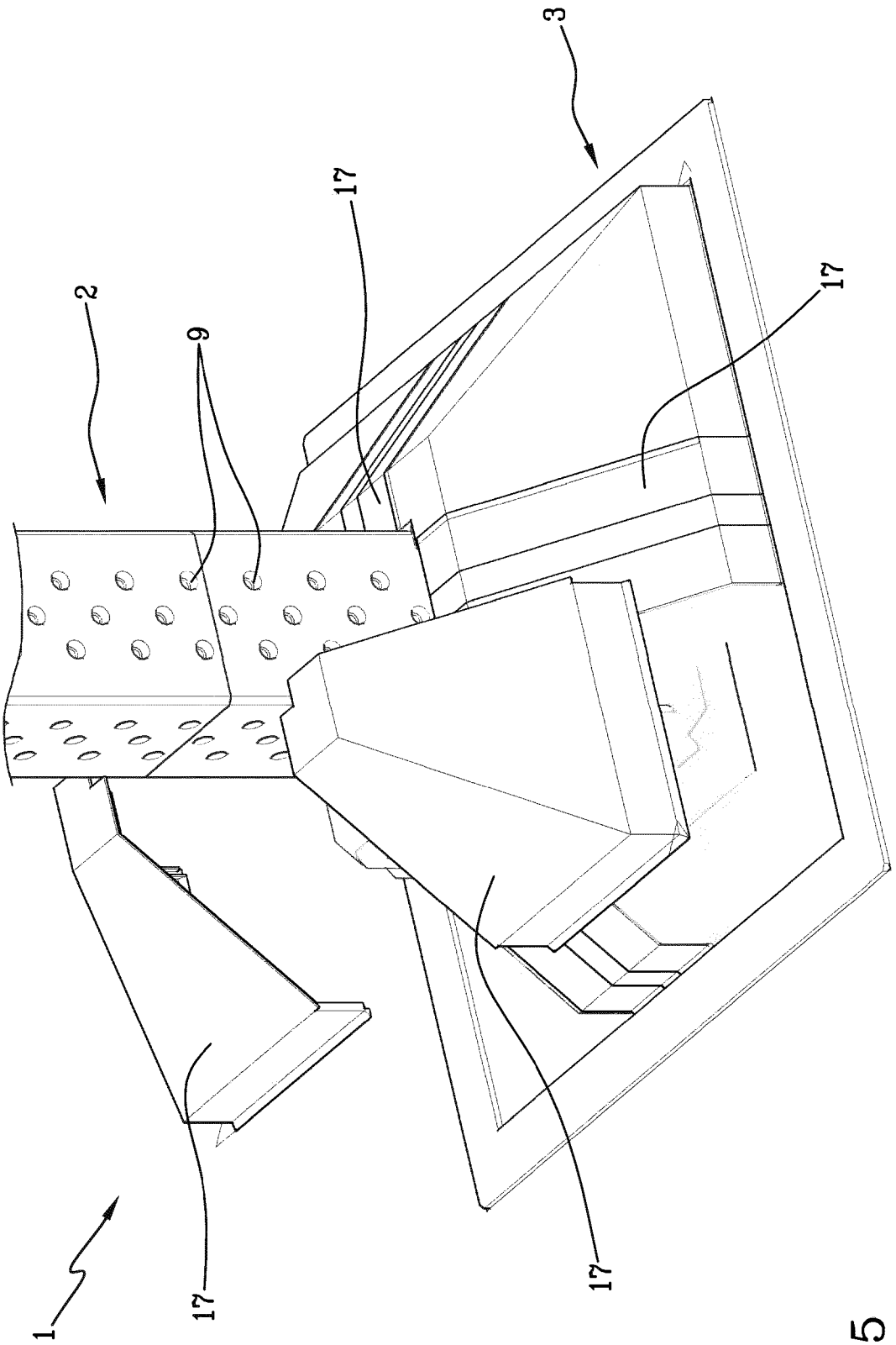


Fig.5

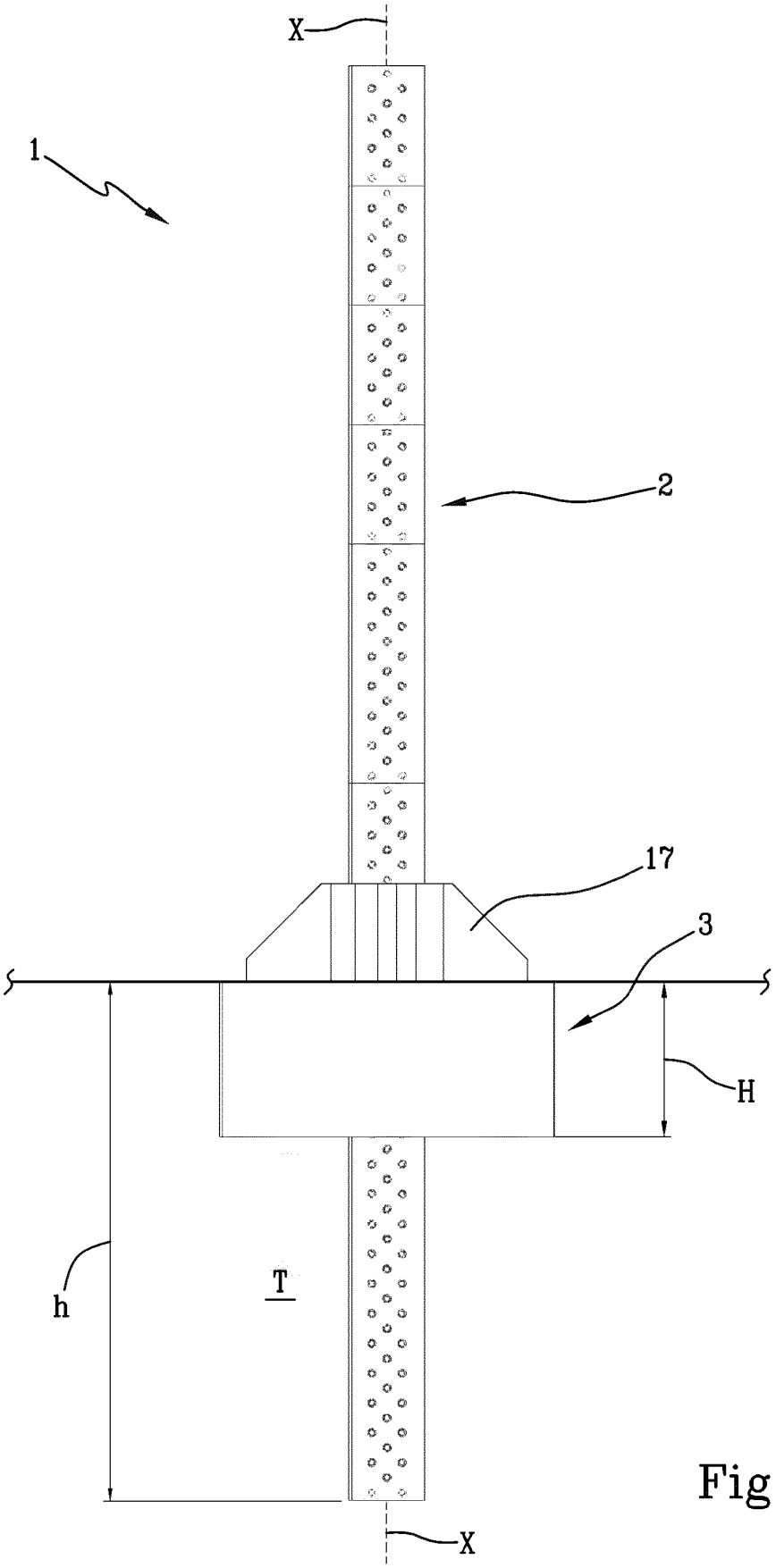


Fig.6

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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