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(54) **METHOD FOR INSTALLING ELECTRICITY PYLONS AND PYLON FOUNDATIONS AND DEVICE FOR THE POSITIONING THEREOF**

(57) The present invention relates to a method for installing electricity pylons and pylon foundations, comprising in order of enumeration: the provision of a control device, comprising an axis control component and a perpendicular control component, at a foundation tube provided at a predefined location for the foundation for the electricity pylon, the positioning of a metal profile into the foundation tube, essentially oriented along the axis of the foundation tube, the connection of the metal profile with at least one component of the control device and the filling up of the foundation tube with concrete, characterized in that the desired position of the profile, in the direction of the axis of the foundation tube and in the perpendicular plane to this direction, as well as the angle of rotation of the profile into said perpendicular plane, can be set by means of the control device. In a second aspect, the invention relates to a device that is destined therefore.

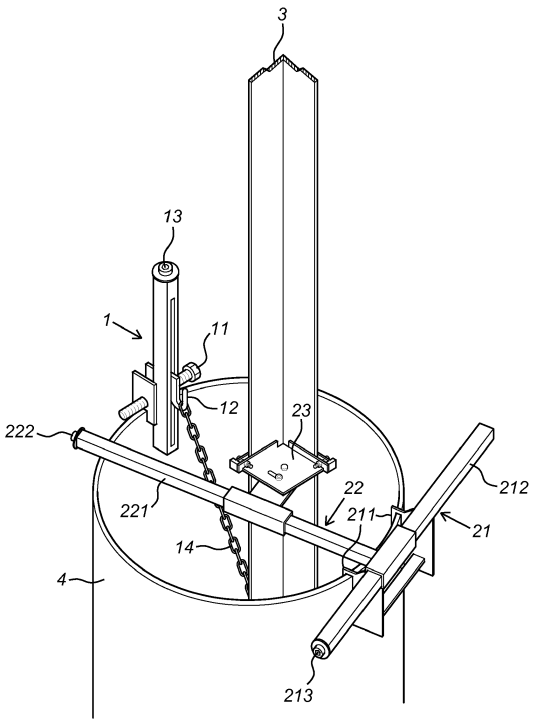

Fig. 1

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Description

TECHNICAL DOMAIN

[0001] The present invention relates to a method for installing electricity pylons and pylon foundations and a device for the positioning thereof

STATE OF THE ART

[0002] When installing an electricity pylon, a foundation must first be provided for. The importance of a very precise positioning (to one millimetre) of this foundation cannot be underlined enough. On the other hand, as a result of the limited stability of the ground, the direct insertion (drilling, vibrating, tapping ...) of a prefabricated foundation tube is mostly a process that cannot be controlled insufficiently: the necessary precision cannot be achieved. For this reason, one will rather opt for an in situ method.

[0003] A first step thereof is the insertion (drilling, vibrating, tapping ...) of a steel foundation tube at the desired location, however with a low precision. Subsequently, a steel profile is placed into this foundation tube, in which one tries to position this profile very precisely and subsequently to fix the obtained position. The foundation tube is then filled up with concrete. After curing the concrete, this projecting part of the steel profile functions as a point of attachment onto the foundation, onto which one can further build. The method assumes that this part is positioned precisely enough.

[0004] However, the very precise positioning and fixation of the steel profile into the foundation tube is far from being evident. Mostly, one uses therefore a device that can be used only once and/or that is not practical for assembling and disassembling. The present invention aims to find a solution for at least some of the above-mentioned problems.

SUMMARY OF THE INVENTION

[0005] The present invention relates to a method for installing electricity pylons and pylon foundations, as well as to a control device for the correct positioning of this pylon foundation.

[0006] First of all, use is made of an in situ process, in which a foundation tube is installed preliminary. This allows a much more precise positioning of (the point of attachment onto) the pylon foundation.

[0007] The method comprises the attachment of the control device onto the foundation tube, the positioning of a profile into the foundation tube, that is fixed to the control device, the setting of the position of the profile by means of the control device, the fixing of the profile in this position and finally, the filling up of the foundation tube with concrete.

[0008] The control device for the correct positioning and fixation of the profile is thereby easy to assemble and disassemble, easy to handle, and moreover, at the least partially reusable.

DESCRIPTION OF THE FIGURES

[0009]

Figure 1 shows a possible embodiment of the present control device, with its axis control component and its perpendicular control component mounted correctly onto the foundation tube as provided for. An L-shaped profile is fixed into the fixation module of the perpendicular control component and is also connected to the axis control component by means of a chain.

Figure 2 is a simplified illustration of an embodiment of the fixation module, seen from the direction of the axis of the foundation tube (in which all components on the foundation tube are mounted as provided for).

Figure 3 is a simplified illustration of a possible embodiment of the invention, in which the profile is supported externally by means of braces. In this way, the profile is fixed in such way that the axis of the profile makes the desired angle α with respect to the axis that is directed to the zenith.

DETAILED DESCRIPTION OF THE INVENTION

[0010] The present invention relates to a method for installing electricity pylons and pylon foundations, as well as a control device for the correct positioning of this pylon foundation.

[0011] Unless otherwise specified, all terms used in the description of the invention, including technical and scientific terms, shall have the meaning as they are generally understood by the worker in the technical field of the invention. For a better understanding of the description of the invention, the following terms are explained specifically.

[0012] "A", "an" and "the" refer in the document to both the singular and the plural form unless clearly understood differently in the context. "A segment" means for example one or more than one segment.

[0013] When "approximately" or "about" are used in the document together with a measurable quantity, a parameter, a period or moment, etc., variations of +/-20% or less, preferably +/-10% or less, more preferably +/-5% or less, still more preferably +/-1% or less, and even still more preferably +/-0.1% or less than and of the cited value are meant, as far as such variations apply to the invention that is described. It will however be clearly understood that the value of the quantity at which the term "approximately" or "about" is used, is itself specified.

[0014] The terms "include", "including", "consist", "consisting", "provide with", "contain", "containing", "comprise", "comprising" are synonyms and are inclusive of

open terms that indicate the presence of what follows, and that do not exclude or prevent the presence of other components, characteristics, elements, members, steps, known from or described in the state of the art.

[0015] In a first aspect, the present invention relates to a method for the installation of electricity pylons and pylon foundations, comprising in order of enumeration:

- providing a control device, comprising an axis control component and a perpendicular control component, at the foundation tube, provided at a predetermined location for the foundation of the electricity pylons,
- positioning a metal profile into the foundation tube, essentially directed along the axis of the foundation tube,
- connecting the metal profile to at least one component of the control device, and
- filling up the foundation tube with concrete.
- In particular, the desired position of the profile, in the direction of the axis of the foundation tube and in the perpendicular plane to this direction, as well as the desired angle of rotation of the profile in said perpendicular plane, can be set by means of the control device.

[0016] The advantage of this method is that the position of the profile in the foundation tube, as well as the angle of rotation of the profile in the perpendicular plane to the axis of the foundation tube, can be set with a sufficiently high precision.

[0017] The axis control component is attached either resting onto, or over the upper edge of the foundation tube. In a preferred embodiment of the method, the axis control component is clamped against or over the upper edge of the foundation tube, by means of a clamp. In a non-limiting embodiment, the axis control component comprises a U-shaped body that is shifted over the edge of the foundation tube. The clamp is then for example a screw or bolt, screwed into a tapped hole in one of the legs of the U-shaped body, which can be tightened against the wall of the foundation tube. In another non-limiting embodiment, the clamping means is a tensioner, for example a polyester tensioner, that is tightened along the outside of the foundation tube and, because it also encloses the axis control component, clamps the latter against the outer wall of the foundation tube.

[0018] The perpendicular control component is positioned resting onto and/or hooked or clamped over the upper edge of the foundation tube. In a preferred embodiment of the method, the perpendicular control component is positioned resting onto the upper edge of the foundation tube, by means of one or more overhanging hooks.

[0019] When reference is made to a direction with respect to a control component or a displacement direction of one of its modules, with respect to the foundation tube, it is always meant the concerning direction with respect to the foundation tube, in which the control component is mounted correctly onto the foundation tube, as provided for. This is in particular the case when we refer to "the direction along/of the axis of the foundation tube", or any "direction in the plane perpendicular to the axis of the foundation tube", such as the "longitudinal direction" and the "width direction" of the perpendicular control component. In the present document, the longitudinal direction and the width direction are two mutually orthogonal directions in the coordinate system of the perpendicular control component, that moreover span a perpendicular plane, perpendicular to the axis of the foundation tube, provided that the perpendicular control component is mounted correctly onto the foundation tube, as provided for.

[0020] The axis control component comprises a module of which the position in the direction of the axis of the foundation tube can be set. This module of the axis control component moreover comprises means for connecting these to the profile in the foundation tube. In a non-limiting preferred embodiment, this module comprises an upwardly directed hook, appropriate for hooking into a chain link. One then connects the profile to the axis control component, by means of a chain. This chain is then attached with its one end to the bottom side of the profile, for example by means of a D-lock through a hole, bored at the bottom of the profile. The other end of the chain can then be hooked into the respective hook. In this way, the position of the profile can be set in the direction of the axis of the foundation tube, because the profile is connected to the adjustable module of the axis control component. The hooking of the chain according to this method moreover allows a fast disassembling of the chain afterwards, after curing the concrete. Thereto, the user must only take the hooked chain from the upwardly directed hook.

[0021] The perpendicular control component comprises a static module, a module that can be set in the width direction, a module that can be set in the longitudinal direction and a fixation module. When using the perpendicular control component, the static module always remains at the same place. In a preferred embodiment, the positions and/or the turning angles of other modules are always set with respect to the static module or with respect to each other. If the perpendicular control component is provided with one or more overhanging hooks, which hook over the upper edge of the foundation tube, these hooks preferably are part of the static module.

[0022] Once the position of the profile has been set in the direction of the axis of the foundation tube, the profile is fixed to the perpendicular control component of the device, more in particular to the fixation module, comprising means for clamping a profile. In case the metal profile has an L-shaped cross-section, the fixation module for example comprises a body with the negative of the interior angle of the L-shaped cross-section, against which the inner side of the L-shaped profile can be clamped, for example by means of clamp blocks that can be tightened by means of bolts. This embodiment allows an easy assembling/disassembling of the metal profile.

Moreover, the fixation module is reusable, considering the standardisation of metal profiles and in particular of L-shaped metal profiles.

[0023] In a preferred embodiment, the metal profile is a steel profile and in a still more preferred embodiment, the surface of this steel profile is moreover treated. The surface is for example galvanized or painted.

[0024] The fixation module is, hinged in the perpendicular plane to the axis of the foundation module, mounted onto the module that can be set in the width direction. After fixing the profile in the fixation module, the angle of rotation of the profile is set in the perpendicular plane onto the axis of the foundation tube.

[0025] Moreover, the perpendicular control component comprises means for blocking the hinging movement of the fixation module under a chosen angle of rotation, and for thus fixing the fixation module under the desired angle of rotation onto the module that can be set in the width direction. In a non-limiting embodiment, the attachment between the fixation module and the module that can be set in the width direction is realized on the overlapping part of two flat parts, the one part belonging to the fixation module, the other part belonging to the module that can be set in the width direction. A first bolt with nut, through a first pair of holes in respectively the two overlapping flat parts, hereby functions as a hinge. A second bolt with nut is attached in the same way through a second pair of holes, with the difference that one of the two holes is now a slotted hole. The slotted hole is hereby formed in such way that a limited hinging movement is possible, but only in case the second nut has not been fully tightened. The two modules can be fixed with respect to each other under a certain hinging angle, exactly by tightening the second nut.

[0026] Subsequently, the position of the profile in the perpendicular plane to the axis of the foundation tube is set, as well as by means of the perpendicular control component. Thereto, the perpendicular control component comprises modules of which the position can be set in a particular direction in said perpendicular plane, specifically for each module, in particular the module that can be set in the width direction and the module that can be set in the longitudinal direction.

[0027] The perpendicular control component comprises means for having the module that can be set in the width direction, shift in the width direction and in an adjustable way over, along and in the module that can be set in the longitudinal direction. The perpendicular control component moreover comprises means for having the module that can be set in the longitudinal direction, shift in the longitudinal direction and in an adjustable way over, along and in the static module. The profile is now fixed to the fixation module. The fixation module, in turn, is fixed under a certain angle of rotation to the module that can be set in the width direction. In this way, the position of the profile in the perpendicular plane to the axis of the foundation tube can be set, by accordingly setting the position of the module that can be set in the width direction with respect to the module that can be set in the longitudinal direction, and that of the module that can be set in the longitudinal direction with respect to the static module.

[0028] The control device used in the present method comprises means to fix the modules that can be set by shifting them, without avoiding subsequent settings. This has the advantage that everything is integrated into one single device. Thus, it is not necessary to provide additional means for the fixation of the profile, after setting its position. In a non-limiting preferred embodiment, the shifting of a first module with respect to a second module, in one or the other sense, is realized by turning a threaded rod with hexagonal end, in respectively the one or the other direction of rotation. The first module thereby comprises a part with adjusted internal thread, into which the threaded rod is screwed. The embodiment should be such that the threaded rod can only turn with respect to the second module, but cannot shift, while the first module can only shift with respect to the second module, but cannot turn. In case the threaded rod does not turn, the first module will not shift, as a result of which it is fixed into a particular position. On the other hand, exactly by turning the threaded rod, the position of the first module is set with respect to the second one.

[0029] The profile is also supported externally by means of shores. The advantage thereof is that the desired angle between the axis directed to the zenith and the axis of the profile can be set with high precision. The shores will also fix the profile into this position. It should be emphasized that, as a result of small inaccuracies when positioning the foundation tube, the axis of the profile should be directed possibly slightly different from the axis of the foundation tube.

[0030] After a provisional positioning of the profile, all adjustable parts of the control device can further be adjusted, for example based on measurements and indications of a surveyor. In this way, possibly after going through an iterative process, one finally obtains a positioning of the profile with the necessary precision.

[0031] Before inserting the profile, the foundation tube can be filled partially with concrete. Also, a reinforcement is applied at one or more different depths in the foundation tube, preferably at two different depths. This is made for example after a first provisional setting of the position of the profile. This reinforcement has the advantage that it increases the strength and cohesion of the final concrete foundation tube.

[0032] After curing the concrete, the control device can at least partially be recuperated. This has the advantage that the cost of this method can be lowered. All parts that are enclosed by concrete are sawn off at the level of the concrete surface. In particular, the chain is sawn off at the level of the concrete surface.

[0033] In a second aspect, the invention relates to a control device, which is appropriate for carrying out the above-described method, more in particular the correct positioning of a profile into a foundation tube. The control

device comprises an axis control component and a perpendicular control component, in which the axis control component and the perpendicular control component each comprise one or more adjustable modules, of which the position in a particular direction, specifically for each module, can be set.

[0034] The axis control component comprises means for clamping it onto or over the upper edge of the foundation tube, appropriate for carrying out the above-described method. When it has been positioned correctly onto the foundation tube, as provided for, the axis control component comprises a module of which the position in the direction of the axis of the foundation tube can be set. This module is also appropriate for carrying out the above-described method. In a preferred embodiment, the axis control component comprises a shaft or tube, oriented according the axis of the foundation tube, at the least provided with a slotted recess, oriented towards the inner side of the foundation tube. Within this vertical shaft, a part can then be shifted, comprising a upwardly directed hook, projecting through the slotted opening. This hook is adjustable in position, for example by means of a threaded rod as described above. The hook is then appropriate for hooking into a link of the chain ensuring the connection between the axis control component and the profile in the foundation tube, as described above by way of a non-limiting example.

[0035] The perpendicular control component, that is positioned correctly onto the foundation tube, as provided for, comprises modules of which the position in a particular direction in the perpendicular plane to the axis of the foundation tube, specifically for each module, can be set, in particular a module that can be set in the width direction and a module that can be set in the longitudinal direction, in which the width direction and the longitudinal direction are two directions as described above. Moreover, the perpendicular control component comprises a static module and a fixation module.

[0036] The static module comprises means for positioning the perpendicular control component resting onto and/or hooked or clamped over the upper edge of the foundation tube. In a preferred embodiment, the static module rests onto the upper edge and/or against the outside of the foundation tube, and it comprises one or more hooks hooking over the upper edge of the foundation tube.

[0037] The perpendicular control component also comprises means for having the module that can be set in the width direction, shift in the width direction and in an adjustable way over, along and in the module that can be set in the longitudinal direction. In a non-limiting embodiment, the module that can be set in the longitudinal direction comprises a first shaft, oriented according to the width direction. The module that can be set in the width direction comprises then a second shaft, which is such that it fits over the first shaft, and can be shifted along this first shaft. In a further embodiment, the first shaft comprises a slotted recess, along its length. Within the first shaft, a threaded rod is located, that can be tightened at its end, but that cannot shift within the first shaft. The second shaft is then attached with a means that extends until in the part enclosed by the first shaft, through a slotted recess, and that in turn is linked to a body that has the corresponding inner thread of the threaded rod, and that is screwed over this threaded rod. In this way, the turning of the threaded rod with respect to the first shaft leads to the shifting of the second shaft with respect to the first one, as described above.

[0038] The perpendicular control component also comprises means for having the module that can be set in the longitudinal direction, shift in the longitudinal direction and in an adjustable way over, along and in the static module. In a non-limiting embodiment, the realization thereof is similar to the suggested realization of the adjustable shifting of the module that can be set in the width direction over, along of into the module that can be set in the longitudinal direction, mutatis mutandis.

[0039] The control device comprises means to fix modules that can be adjusted by shifting them, without avoiding subsequent settings. This is indeed the case in the above-mentioned non-limiting embodiments, which comprise a threaded rod that can be into the inner shaft, and a means with corresponding inner thread into which the threaded rod can be screwed and that is connected to the outer shaft that can be shifted.

[0040] The fixation module comprises means for clamping a metal profile. If use is made of a profile with an L-shaped cross-section, the fixation module for example comprises a body with the negative of the interior angle of the L-shaped cross-section, against which the inner side of the L-shaped profile can be clamped, for example by means of clamp blocks that can be tightened by means of bolts. This embodiment allows an easy assembling/disassembling of the metal profile. Moreover, the fixation module is reusable, considering the standardisation of the measures of metal profiles and more in particular of L-shaped metal profiles.

[0041] The fixation module is, hinged in the perpendicular plane to the axis of the foundation module, mounted onto the module that can be set in the width direction. Moreover, the perpendicular control component comprises means for blocking the hinging movement of the fixation module in a chosen angle of rotation, and for fixing the fixation module in this way under the desired angle of rotation onto the module that can be set in the width direction. In a non-limiting embodiment, the attachment between the fixation module and the module that can be set in the width direction is realized onto the overlapping part of two flat parts, the one part belonging to the fixation module, the other part belonging to the other module. A first bolt with nut, through a first pair of holes in respectively the two overlapping flat parts, hereby functions as a hinge. A second bolt with nut is attached in the same way through a second pair of holes, with the difference that one of the two holes is now a slotted hole. The slotted hole is thereby formed in such way that a limited hinging

movement is possible in case the second nut is not fully tightened, while the two modules can be fixed with respect to each other under a particular hinging angle, exactly by tightening the second nut.

[0042] It will be understood that the present invention is not limited to the embodiments described above and that some adjustments or changes can be added to the described examples without changing the scope of the enclosed claims.

DETAILED DESCRIPTION OF THE FIGURES

[0043] In the following, the different aspects of the present invention will be further illustrated by means of examples and figures, without being limited to these examples and figures.

[0044] **Figure 1** shows both components of the control device, that is, the axis control component 1 and the perpendicular control component 2, mounted correctly onto the foundation tube 4, as provided for. An L-shaped profile 3 is also inserted into the foundation tube 4 and is attached to the control device. The axis control device shifts over the upper edge of the foundation tube and is clamped onto this upper edge. Thereto, a bolt 11 has been provided, that is tightened against the edge of the foundation tube 4. Furthermore, the axis control component 1 comprises a shaft, that is oriented according to the axis of the foundation tube 4 with a slotted hole, that is oriented towards the inside of the foundation tube 4. An adjustable part that can be shifted, extends within the latter shaft, in which the part comprises an upwardly oriented hook 12 protruding through the slotted hole. The position of this upwardly oriented hook 12 can be set by tightening a threaded rod 13 above. The upwardly directed hook is connected to an L-shaped profile, by means of a chain 14. The perpendicular control component 2 comprises a static module 21, a module that can be set in the longitudinal direction 22, a module that can be set in the width direction 23 and a fixation module 24. The static module 21 rests over the upper edge of the foundation tube 4, by means of overhanging hooks 211. Furthermore, it comprises a shaft 212, oriented according to the longitudinal direction. The module that can be set in the longitudinal direction 22 comprises a part that shifts over the latter shaft 212, in the longitudinal direction and in an adjustable way, in which the adjustment of the position is realized by turning the threaded rod 213 at its end. The module that can be set in the longitudinal direction also comprises a shaft 221, which is oriented according to the width direction. The module that can be set in the width direction 23 comprises a part that shifts over the latter shaft 221, in the width direction and in an adjustable way, in which the adjustment of the position is made by turning the threaded rod 222 at its end. To the module that can be set in the width direction 23, the fixation module 24 is attached.

[0045] **Figure 2** is a simplified illustration of the fixation module 24, seen from the direction of the axis of the foundation tube (in which all components are mounted on the foundation tube as provided for). The fixation module is formed in such way that an L-shaped profile 3 can be fixed into it. Thereto, the clamp blocks 241 are clamped against the L-shaped profile 3, by tightening the clamp bolts 242. Furthermore, the fixation module 24 is mounted in a hinging way to the module that can be set in the width direction 23, in which the fixation module can hinge in the perpendicular plane to the axis of the foundation tube. For the hinging connection, two bolts with corresponding nut are used: one the one hand, the hinging bolt 243 and on the other hand, the blocking bolt 244. The latter is used for blocking the hinging movement under the desired angle of rotation, and can thereto be clamped in the slotted hole 245 in the fixation module.

[0046] **Figure 3** is a simplified illustration of a possible embodiment of the invention, in which the L-shaped profile 3 is positioned in the foundation tube 4, and is then supported externally by means of shores 5. In this way, the profile is fixed in such way that the axis of the profile makes the desired angle α with respect to the axis that is directed to the zenith.

Parts in the figures:

[0047]

1. Axis control component
    - 11. Bolt
    - 12. Upwardly directed hook
    - 13.Threaded rod
    - 14. Chain
2. Perpendicular control component
    - 21. Static module
        - 211. Hook system
        - 212.Shaft in the longitudinal direction
        - 213.Threaded rod in this shaft
    - 22. Module that can be set in the longitudinal direction
        - 221.Shaft in the width direction
        - 222.Threaded rod in this shaft
    - 23. Module that can be set in the width direction
    - 24. Fixation module
        - 241.Clamp blocks
        - 242.Clamp bolts
        - 243.Hinging bolt
        - 244.Blocking bolt
        - 245.Slotted hole
3. L-shaped profile

4. Foundation tube
5. Shores

Claims

1. A method for installing electricity pylons and pylon foundations, comprising, preferably in order of enumeration:

   - providing a control device comprising an axis control component 1 and a perpendicular control component 2, at a foundation tube 4, which foundation tube is provided at a predetermined location for the foundation of the electricity pylon,
   - positioning a metal profile 3 into the foundation tube 4, essentially directed along the axis of the foundation tube 4,
   - connecting the metal profile 3 to at least one component of the control device, and
   - filling up the foundation tube 4 with concrete.

   characterized in that the desired position of the profile 3, in the direction of the axis of the foundation tube 4 and in the perpendicular plane to this direction, as well as the desired angle of rotation of the profile 3 in said perpendicular plane, can be set by means of the control device.

2. The method of claim 1, **characterized in that** the axis control component 1 is clamped against or over the upper edge of the foundation tube 4.

3. The method of any one of the claims 1 and 2, **characterized in that** the perpendicular control component 2 is positioned resting onto and/or hooked or clamped over the upper edge of the foundation tube 4.

4. The method of any one of the previous claims, **characterized in that** a reinforcement is positioned at one or more different depths in the foundation tube 4, preferably at two different depths.

5. The method of any one of the previous claims, **characterized in that** use is made of a profile 3 with L-shaped cross-section.

6. A control device, used for the correct positioning of a profile 3 into a foundation tube 4, comprising an axis control component 1 and a perpendicular control component 2, **characterized in that** the axis control component 1 and the perpendicular control component 2 each comprise one or more adjustable modules, of which the position in a particular direction, or of which the angle of rotation within a particular plane can be adjusted depending on each module specifically.

7. The control device of claim 6, **characterized in that** the axis control component 1 comprises means for clamping it onto or over the upper edge of the foundation tube 4.

8. The control device of any one of the claims 6 and 7, **characterized in that** the axis control component 1, when positioned correctly onto the foundation tube 4, comprises a module of which the position can be set in the direction of the axis of the foundation tube 4.

9. Control device of any one of the claims 6 to 8, **characterized in that** the latter module of the axis control component 1 comprises means for connecting it to the profile 3 in the foundation tube 4.

10. The control device of any one of the claims 6 and 9, **characterized in that** the perpendicular control component 2 comprises a static module 21, comprising means 211 for positioning the perpendicular control component resting onto and/or hooked or clamped over the upper edge of the foundation tube 4.

11. The control device of any one of the claims 6 to 10, **characterized in that** the perpendicular control component 2, when positioned correctly onto the foundation tube 4, comprises modules the position of which can be set in a particular direction within the plane perpendicular to the axis of the foundation tube 4, depending on each module specifically, in particular a module that can be set in the width direction 23 and a module that can be set in the longitudinal direction 22, in which the width direction and the longitudinal direction are two, mutually orthogonal directions in the plane perpendicular to the axis of the foundation tube 4.

12. The control device of any one of the previous claims, **characterized in that** the perpendicular control component 2 comprises means for having the module that can be set in the width direction 23, shift into the width direction, in an adjustable manner, over, along, or within the module that can be set in the longitudinal direction 22.

13. The control device of any one of the previous claims, **characterized in that** the perpendicular control component 2 comprises means for having the module that can be set in the longitudinal direction 22, shift into the longitudinal direction, in an adjustable manner, over, along and in the static module 21.

14. The control device of any one of the previous claims, **characterized in that** it comprises means for fixing the modules that can be set by shifting them, without avoiding subsequent settings.

15. The control device of any one of the previous claims, **characterized in that** the perpendicular control component comprises a fixation module 24 comprising means for clamping a metal profile 3, which fixation module 24 is mounted onto the module that can be set in the width direction 23, such that it can hinge in the plane perpendicular to the axis of the foundation tube 4.

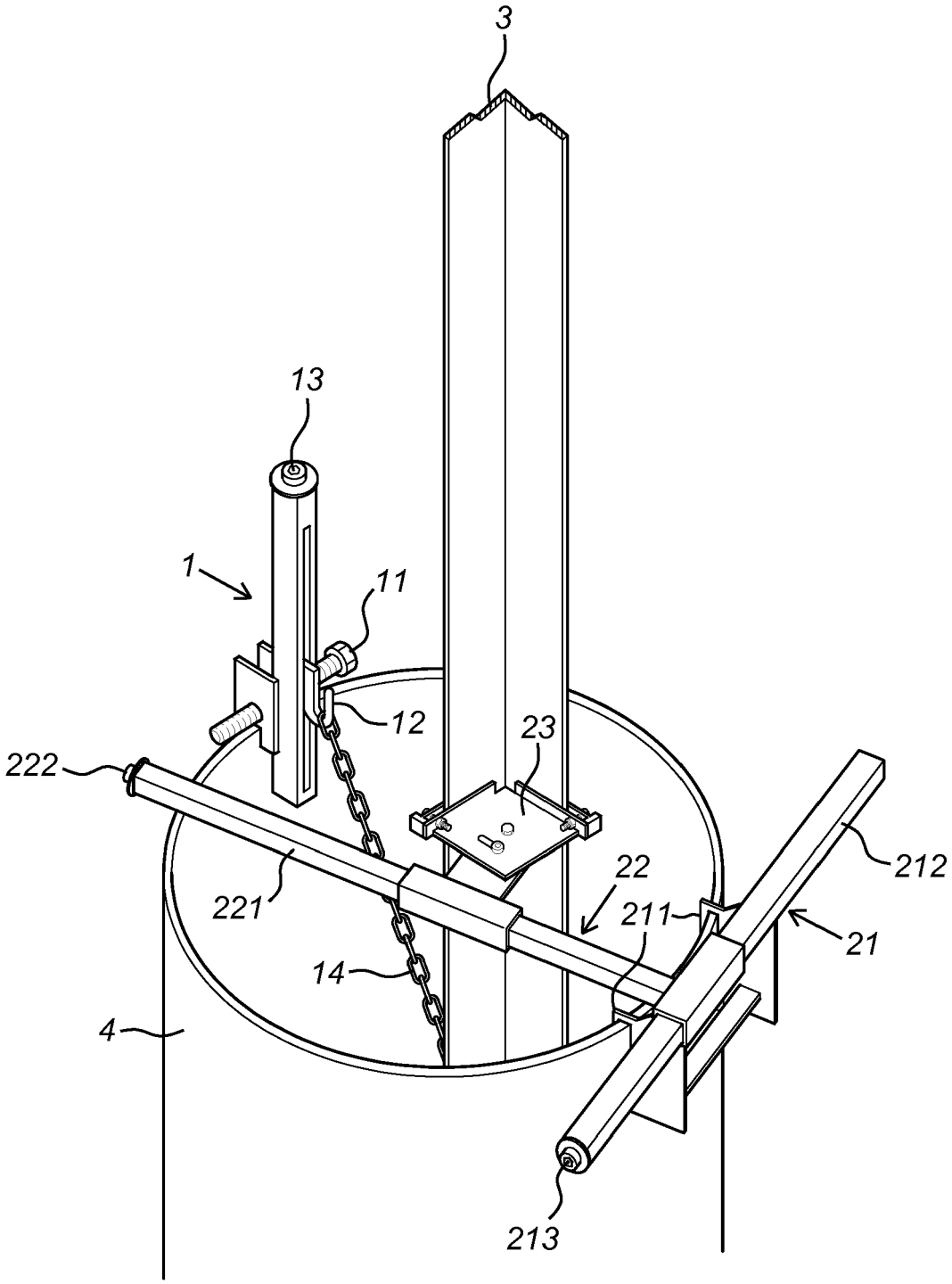

Fig. 1

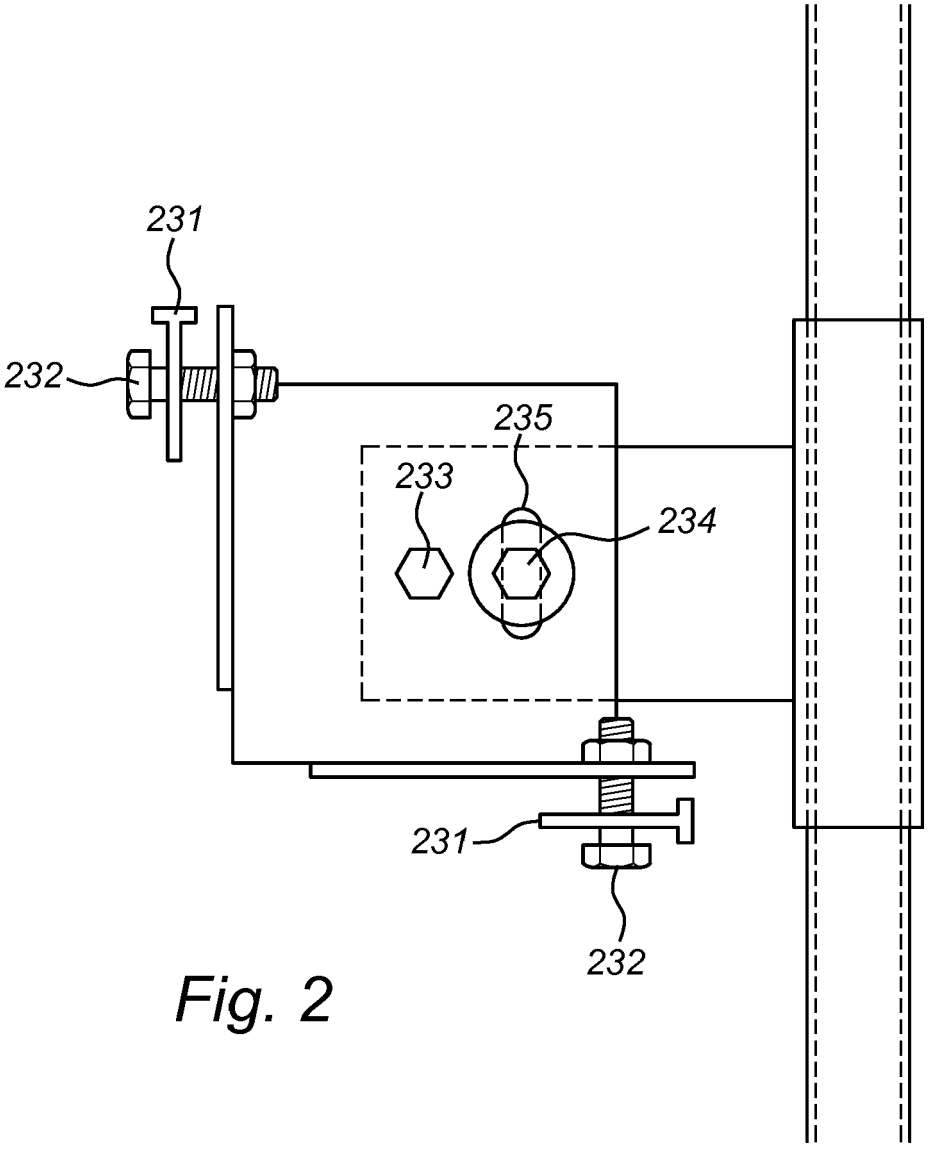

Fig. 2

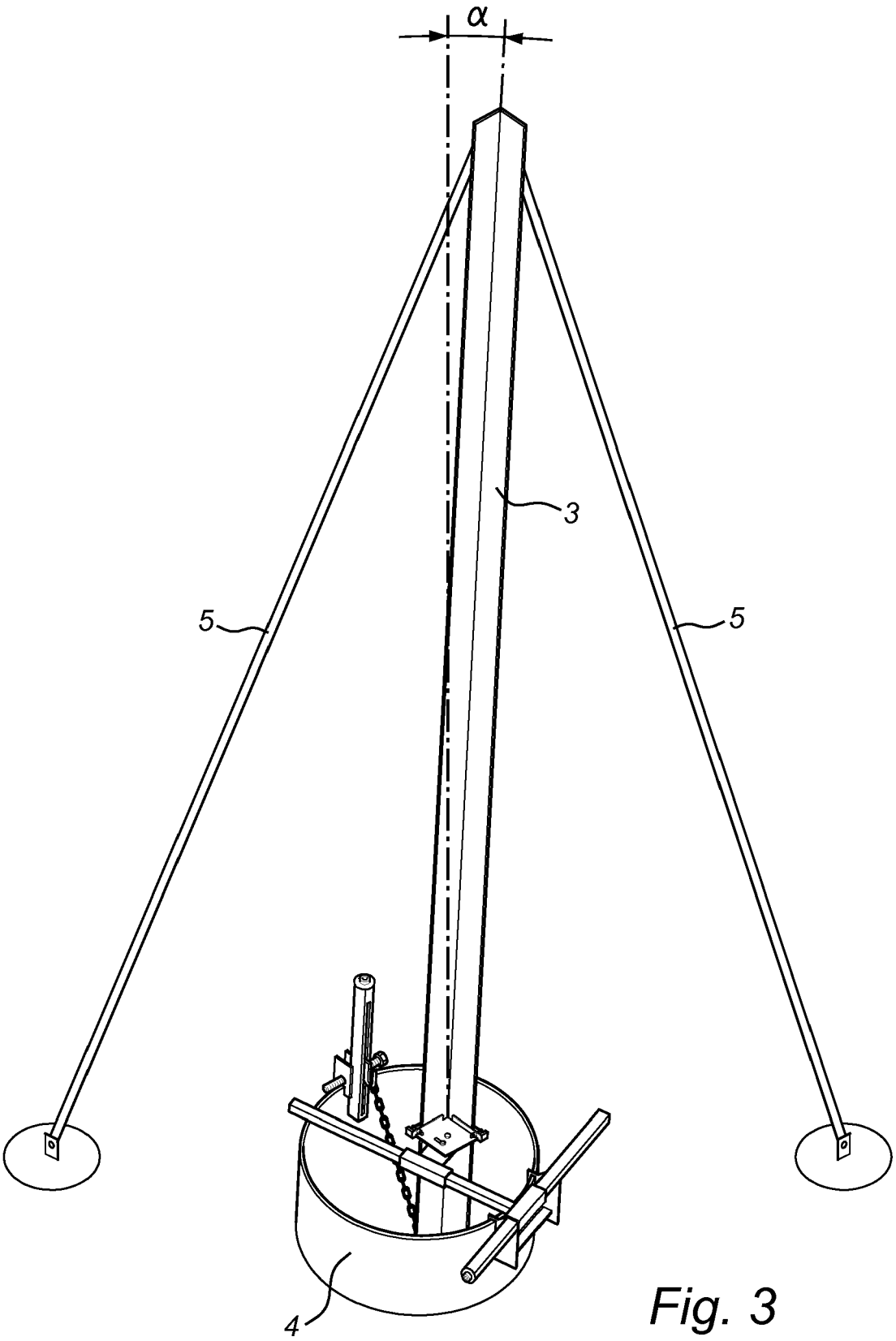

Fig. 3

Europäisches Patentamt
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EUROPEAN SEARCH REPORT

Application Number
EP 17 19 3174

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 6 419 201 B1 (HUGHES JR JOHN M [US] ET AL) 16 July 2002 (2002-07-16)	6	INV. E02D27/42 E04H12/22 E04H12/20
A	* abstract; figures 1-3 *	1-5,7-15	
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Place of search	Date of completion of the search	Examiner
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