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(54) Method for positioning concrete piles

(57) The invention relates to a method for positioning the ends of concrete piles (3). Before piles (3) are driven into the ground, the building land is probed, after which a fitting pile (3) is manufactured for every location. The piles (3) are manufactured such that on a top side a reinforcement (5) projects from the pile or may be inserted into the pile (3).

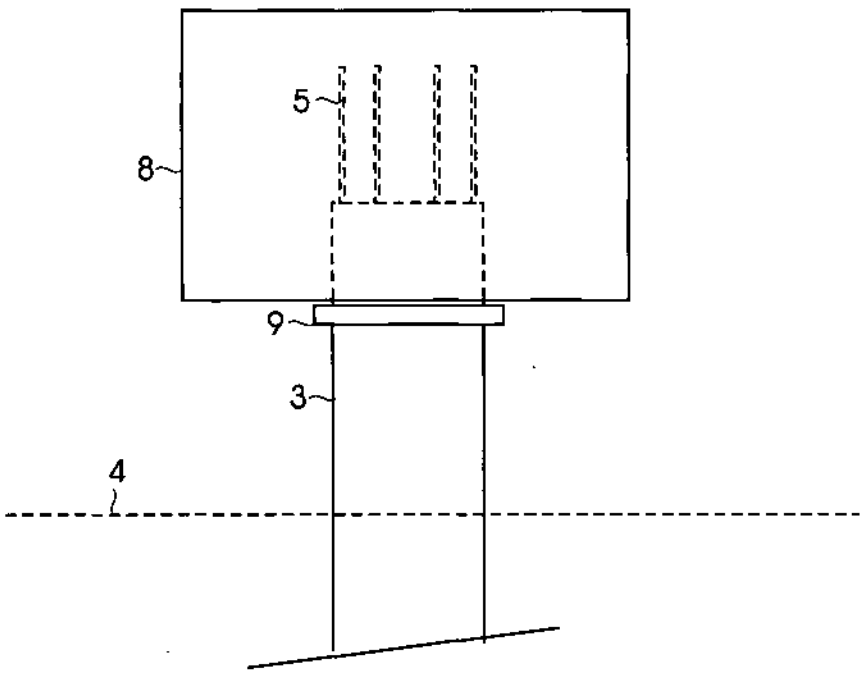

Fig. 3A

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Description

[0001] The invention relates to a method for positioning concrete piles, according to which a number of piles is driven into the ground on previously determined locations on a building land. According to the state of the art, a pile is continued to be driven into the ground until the pile obviously has sufficient bearing. Subsequently, the parts of the piles projecting from the building land are trimmed to a previously determined height above the building land. This trimming is labour-intensive and it produces a lot of rubbish. The method according to the invention obviates this drawback and is characterised in that beforehand the building land is probed, that for every previously determined location a pile is manufactured with a length determined on the basis of data obtained during probing and that subsequently each pile is driven into the ground on the corresponding location. In this way, the length of the ends of the piles projecting from the building land can be determined relatively precisely, which means that it is no longer necessary to shorten them.

[0002] According to the state of the art, the projecting parts of the piles are subsequently treated such that the part of the reinforcement is exposed, so that the reinforcement can be included perfectly well in a foundation to be cast on top of the piles. This treatment is labour-intensive as well and produces a lot of rubbish. A favourable realisation of the inventive method which substantially obviates this disadvantage is characterised in that the pile is fabricated such that on one end a reinforcement projects from the pile or that on one end an opening is made in which a reinforcement may be put in after the pile is driven into the ground. The projecting reinforcement may be covered by a head while driving the pile in the ground. The result is that the foundation may be cast directly onto and round the end of the pile.

[0003] As the positions of the ends of the piles are known rather precisely now, it becomes possible to leave out the foundation and to make the pile as such support a building construction instead. A favourable realisation of the inventive method with which a very precise positioning of the end of the pile may be obtained is characterised in that a pile is fabricated such that on one end a reinforcement projects from the pile and that after the pile has been driven into the ground practically each pile is provided with an individual form round the end, into which subsequently concrete is poured. In this way, corrections may easily be made in the height and in a horizontal position.

[0004] For example for prefabricated houses, it may be advantageous to make the floor parts rest directly onto columns, with the columns being anchored into the ground. A favourable embodiment which enables a precise coupling between a column and a pile is characterised in that before pouring the concrete into the form, a column is placed into the form, which column is fabricated such that on one end a reinforcement projects from the column and that when pouring the concrete this end points downwards. Preferably, another reinforcement is placed in the form round the projecting reinforcement of the pile and the column before pouring the concrete into the form.

[0005] A favourable realisation of the inventive method which makes it possible to precisely position the column with respect to the pile is characterised in that a top lid of the form is slidably mounted with respect to a bottom of the form and is provided with an opening via which the column may pass. Preferably, arresting means are positioned round the column before the column is placed, with which the height may be adjusted.

[0006] A favourable alternative realisation of the inventive method, which may be applied advantageously when the piles must be positioned precisely is characterised in that a pile is fabricated such that in one end an opening is made in which a reinforcement may be put after the pile is driven into the ground and that after the piles have been driven into the ground the opening of practically each pile is provided with a reinforcement and an already cured concrete head is grouted onto and round the end. In this case it is sufficient to temporary install a shuttering or a form under the head.

[0007] The invention also relates to piles, columns and forms, suitable to be used while executing a method according to the invention.

[0008] The invention will now be further explained with a reference to the following figures, in which:

- Fig. 1 schematically shows a floor plan for a prefab house in top view;
- Fig. 2A shows a pile according to the invention;
- Fig. 2B shows the pile while being driven;
- Fig. 3A shows the pile together with a form in side view;
- Fig. 3B shows the pile together with form in top view;
- Fig. 4 shows the pile together with a form and a column;
- Fig. 5A shows a pile provided with a central opening in side view;
- Fig. 5B shows the pile in cross section, together with a prefabricated head placed on top.

[0009] Fig. 1 gives as an example of a possible application of the inventive method a floor plan of a prefab house in top view. The floor consists of prefab floor parts 1a,1b,.. of which corners and edges rest onto columns 2a,2b,... Obviously, the upper ends of the columns 2a, 2b,.. must be precisely positioned, as they directly determine the position of floor parts 1a,1b,.. For that reason, it is impossible to directly drive the columns 2a,2b,.. into the ground, as on the one hand it is not known to what depth the piles can and/or must be driven and on the other hand because the ends of columns 2a,2b,.. tend to move in a horizontal direction while being driven. According to the invention, the underlying ground is probed beforehand, preferably at those places where afterwards the columns 2a,2b,.. will be driven into the ground. Next,

piles are produced on the basis of data obtained during probing, such that every pile can be driven substantially completely into the ground.

[0010] Fig. 2A shows a pile 3 according to the invention, after it has been driven substantially completely into the ground 4. Special is that the top side is finished in such a way that a reinforcement 5 projects from pile 3 in a previously determined pattern. It is simple now to cast a short, concrete column on top of pile 3 after pile 3 has been driven into the ground, which column forms the actual support for floor parts 1a, 1b,.. in Fig. 1. Fig. 2B shows pile 3 while being driven into the ground, with a steel head 6 being placed on top of it, which is internally provided with recesses which may accommodate the projecting reinforcement 5 and which conducts the impulse of hammer 7 directly to pile 3.

[0011] Fig. 3A shows in side view pile 3, after a form 8 has been placed round the upper end. The height of the form can be adjusted in an obvious manner with the aid of a clamping ring 9 which has previously been placed round pile 3, after which the form is filled up. The top side of the short column thus obtained, is precisely positioned and forms a supporting surface for the floor parts 1a,1b,.. in Fig. 1. Fig. 3B shows pile 3 together with form 8 in top view. Form 8 is made of two halves 8a,8b, which may be uncoupled with the aid of bolts 10a,10b, so that form 8 may easily be removed and can be reused.

[0012] Fig. 4 shows in side view pile 3, after a form 8 has been placed round the upper end. The height of the form can be adjusted in an obvious manner with the aid of a clamping ring 9 which has previously been placed round pile 3. Onto form 8 a lid 11 is placed, provided with an opening through which a prefab column 12 can enter form 8. The depth to which column 12 can enter may be adjusted with the aid of a clamping ring 13 which has previously been placed round column 12. A bottom side of column 12 is provided with a projecting reinforcement 14. Lid 11 can be placed on top of form 8 and be shifted, until column 12 is positioned exactly at the right place, after which form 8 can be filled up, for example via a funnel 15. If desired, a steel basket 16 can be placed round the projecting reinforcement 5 of pile 3 and round the projecting reinforcement 14 of column 12 in order to strengthen the connection.

[0013] It goes without saying that the inventive method is not only suitable for supporting floor parts of prefab buildings, but that it can be used in fact whenever a classical foundation is unnecessary or unwanted.

[0014] Fig. 5A shows in side view a pile 3, in which centrally an opening 17 is made, which does not require special provisions when being driven, but which may accommodate a reinforcement after the pile has been driven and round which a slightly adjustable head may be fitted.

[0015] Fig. 5B shows pile 3 in cross section, with an opening 17 in it, into which a steel rod 18 is placed which acts as a reinforcement. Round pile 3 and rod 18 a prefabricated concrete head 19 is placed and adjusted with the aid of a clamping ring 9, whereby head 19 can be positioned in a horizontal direction as well as in a vertical direction with respect to pile 3, in order to compensate for small displacements arising from the driving action. Once head 19 has been adjusted, the space between head 19 and pile 3 and opening 20 itself can be filled up with concrete via opening 20, with the aid of a funnel 15.

Claims

1. Method for positioning concrete piles, according to which a number of piles is driven into the ground on previously determined locations on a building land, **characterised in that** beforehand the building land is probed, that for every previously determined location a pile is manufactured with a length determined on the basis of data obtained during probing and that subsequently each pile is driven into the ground on the corresponding location.

2. Method according to claim 1, **characterised in that** the pile is fabricated such that on one end a reinforcement projects from the pile or that on one end an opening is made in which a reinforcement may be put in after the pile is driven into the ground.

3. Method according to claim 2, **characterised in that** a pile is fabricated such that on one end a reinforcement projects from the pile and that after the pile has been driven into the ground practically each pile is provided with an individual form round the end, into which subsequently concrete is poured.

4. Method according to claim 3, **characterised in that** before pouring the concrete into the form, a column is placed into the form, which column is fabricated such that on one end a reinforcement projects from the column and that when pouring the concrete this end points downwards.

5. Method according to claim 4, **characterised in that** before pouring the concrete a reinforcement is placed in the form round the projecting reinforcement of the pile and the column.

6. Method according to claim 5, **characterised in that** a top lid of the form is slidably mounted with respect to a bottom of the form and is provided with an opening via which the column may pass.

7. Method according to claim 2, **characterised in that** a pile is fabricated such that in one end an opening is made in which a reinforcement may be put after the pile is driven into the ground and that after the piles have been driven into the ground the opening of practically each pile is provided with a reinforcement and an already cured concrete head is grouted

onto and round the end.

8. Piles, to be used for executing a method according one of the previous claims.

9. Columns, to be used for executing a method according one of the claims 4 to 6.

10. Forms, to be used for executing a method according one of the claims 3 to 7.

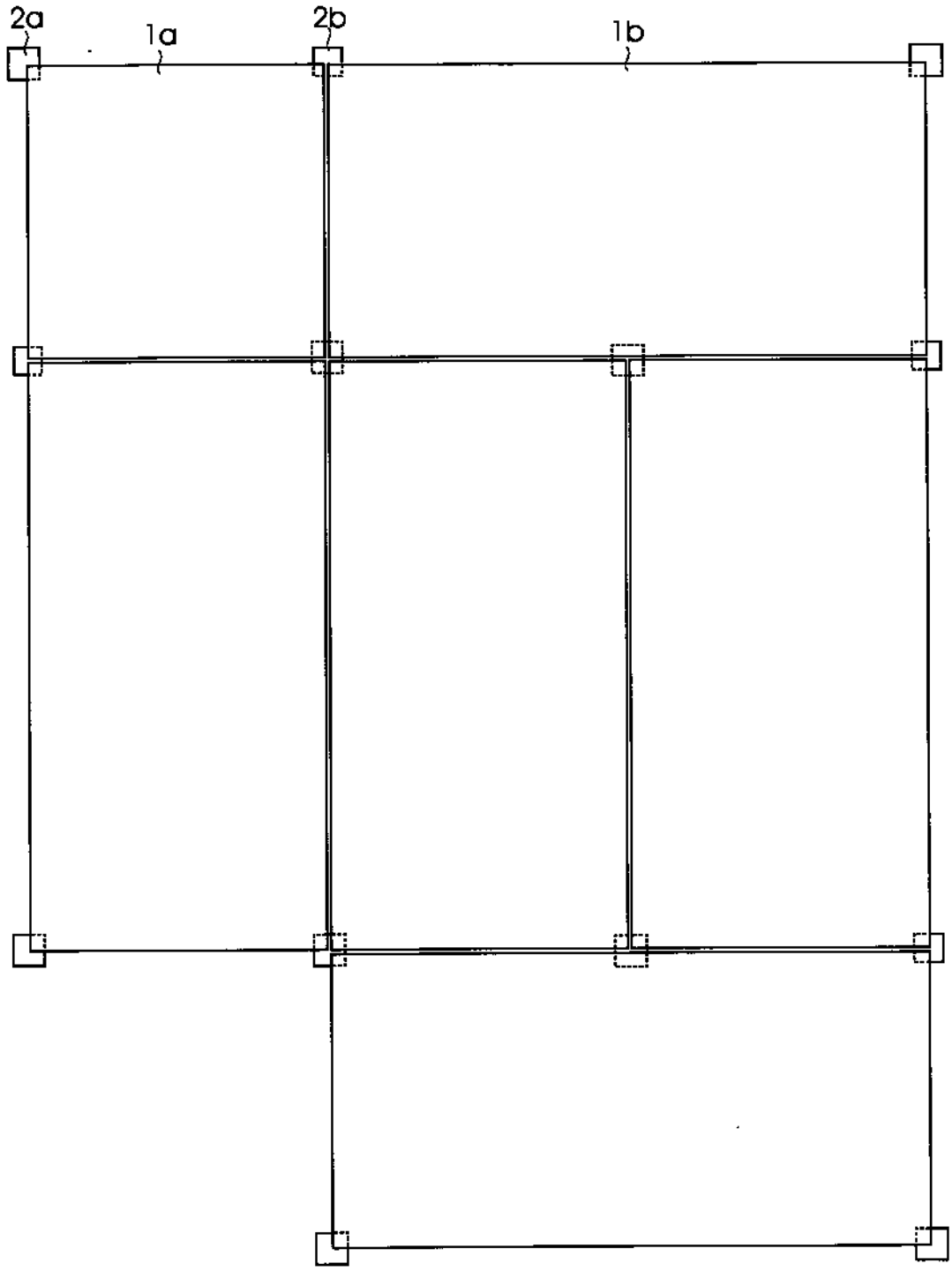

Fig. 1

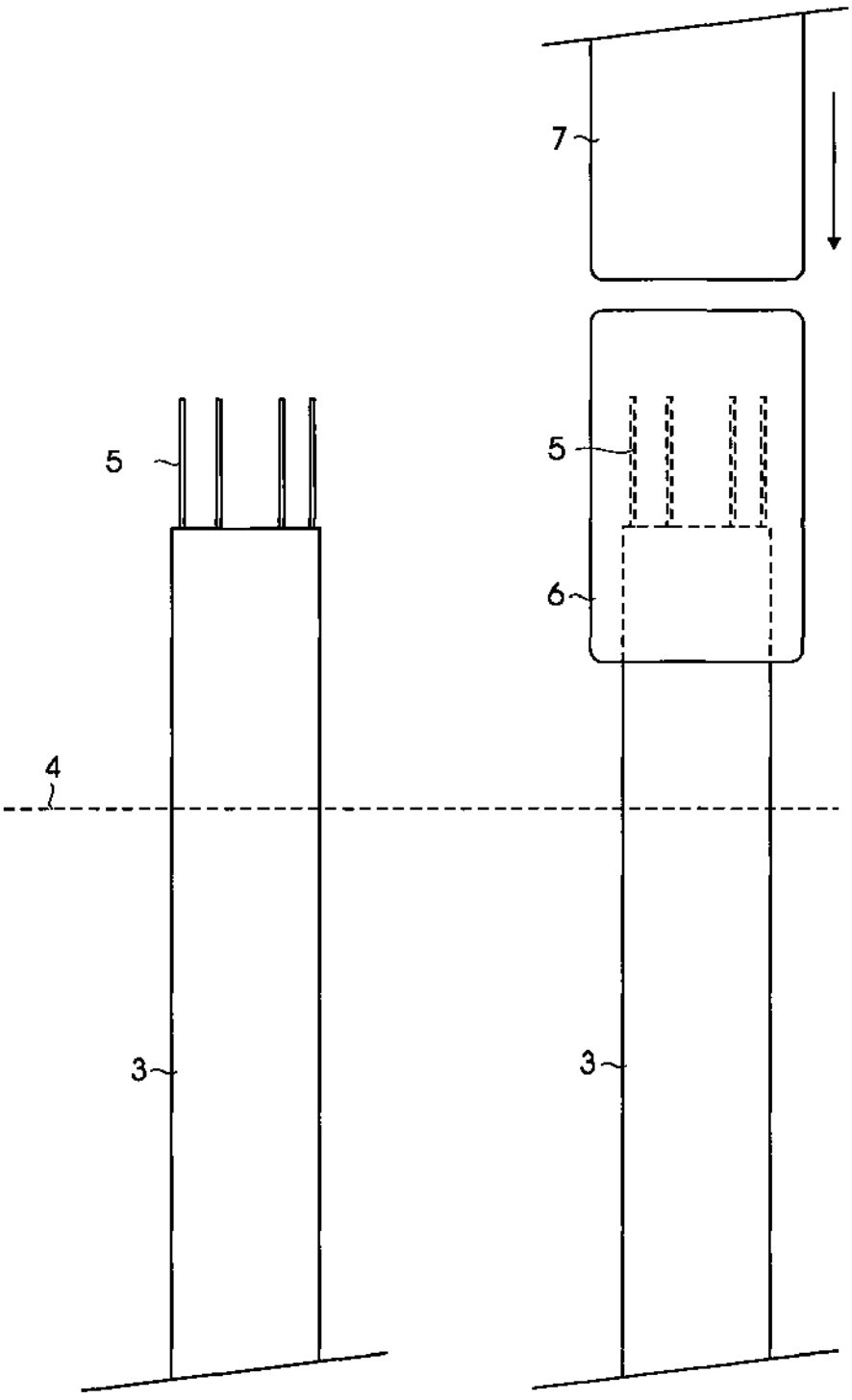

Fig. 2A

Fig. 2B

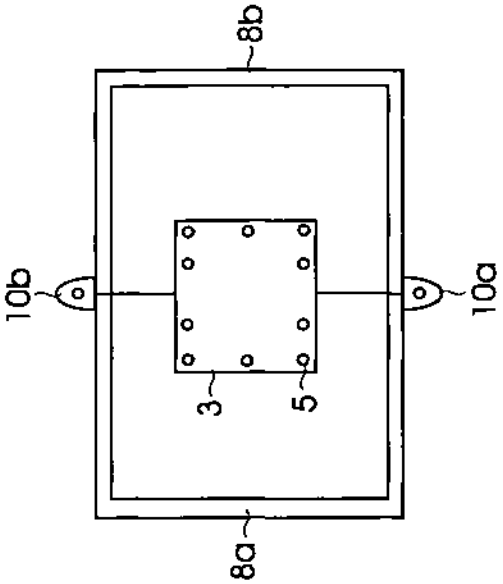

Fig. 3B

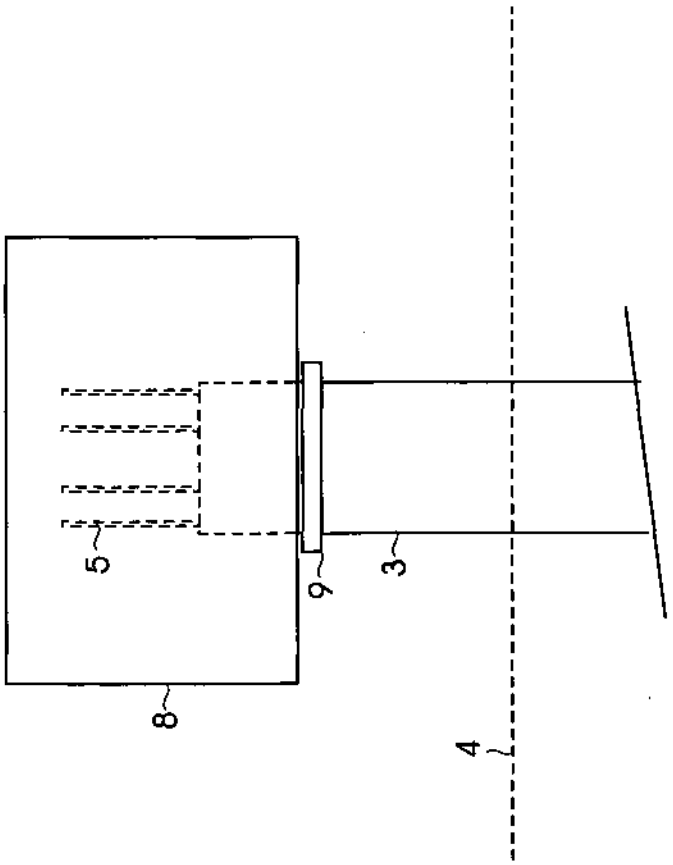

Fig. 3A

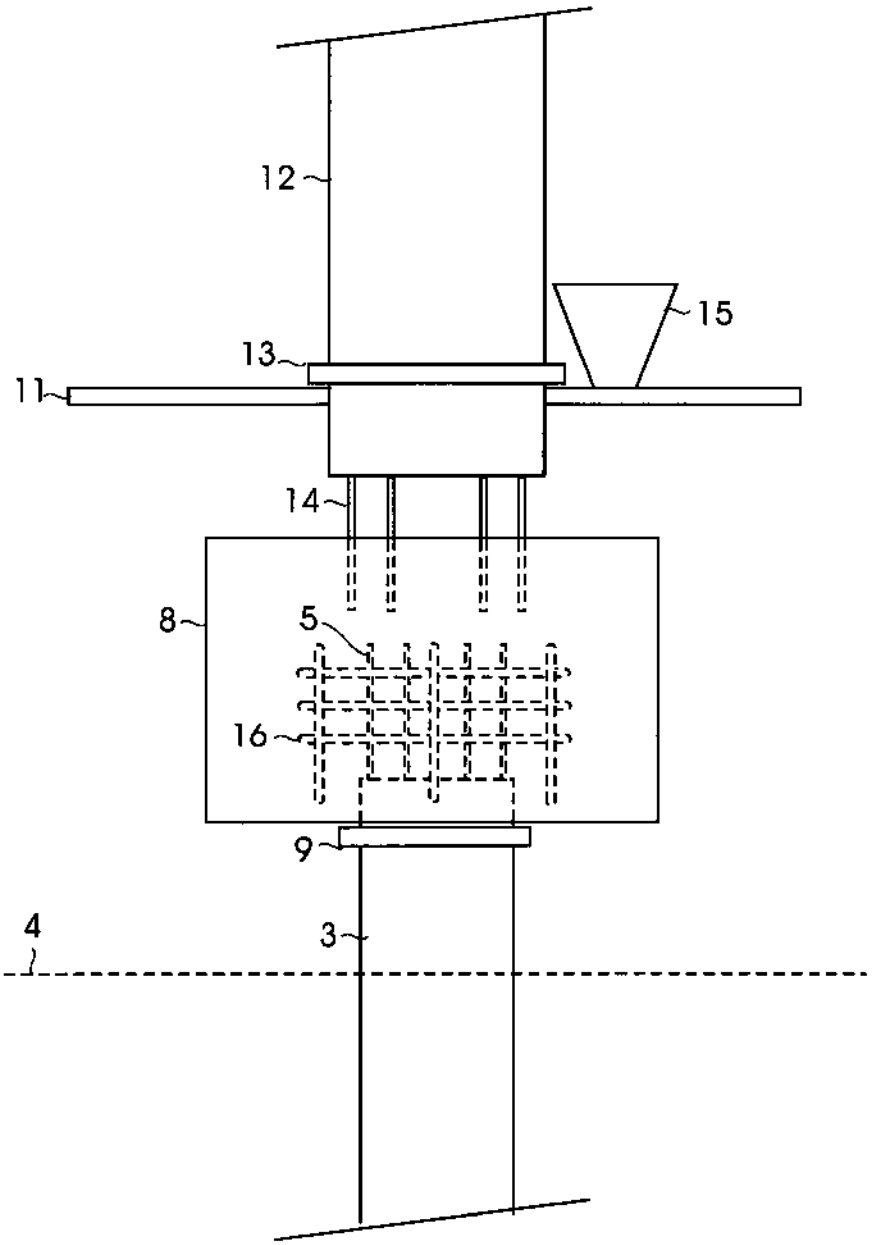

Fig. 4

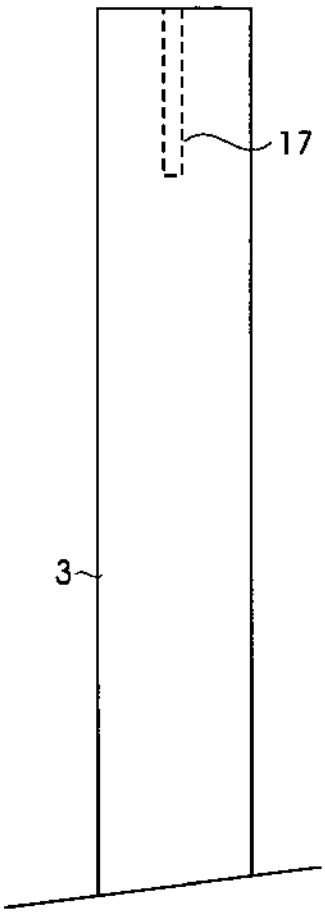

Fig. 5A

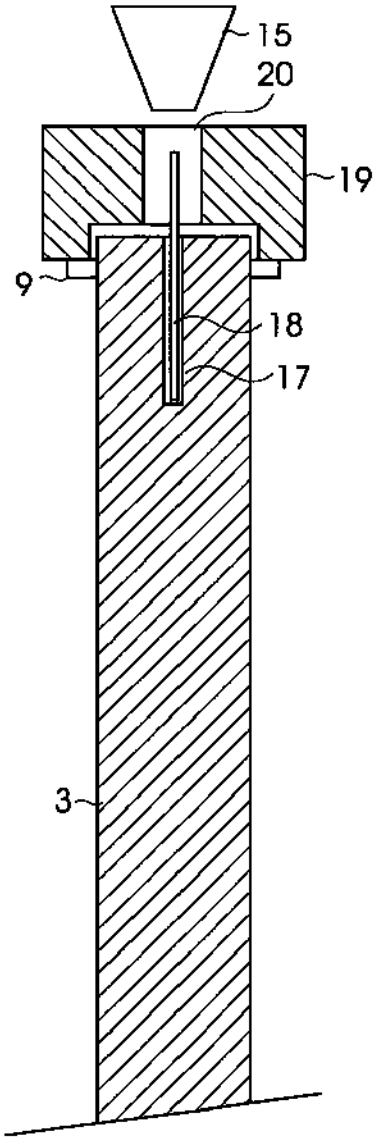

Fig. 5B