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(72) Inventor: **Cerato, Gino**
46033 Castel d'Ario (Mantova) (IT)

(74) Representative: **Petazzi, Guido**
c/o Malgarini Ing. Lucia,
Via Divisione Acqui, 6
46044 Goito (MN) (IT)

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(71) Applicant: **Cerato, Gino**
46033 Castel d'Ario (Mantova) (IT)

(54) Supporting and holding device for positioning formworks

(57) The invention described is a supporting and holding device for positioning formworks comprising a first element (2) constituted of a tubular portion designed to come into contact with a peg (10) and a support element (3) fastened to the first element (2) and constituted of an angular portion composed of a pair of flat elements (3a) and (3b) positioned at right angles to each other and fastened together at the contact angle and envisaged to bear and hold a board (5). The device also com-

prises one or more bits present for plumbining a support structure.

The device is designed to be set from a resting position, in which the first element (2) is not fastened to the said peg (10), the support element (3) is not holding a board (5) and the bits are not being used keep apart a support structure, to an operative position, in which the first element (2) is slid onto a peg (10) planted in the ground and on the support element (3) there is a board and the bits keep the support structure perfectly vertical.

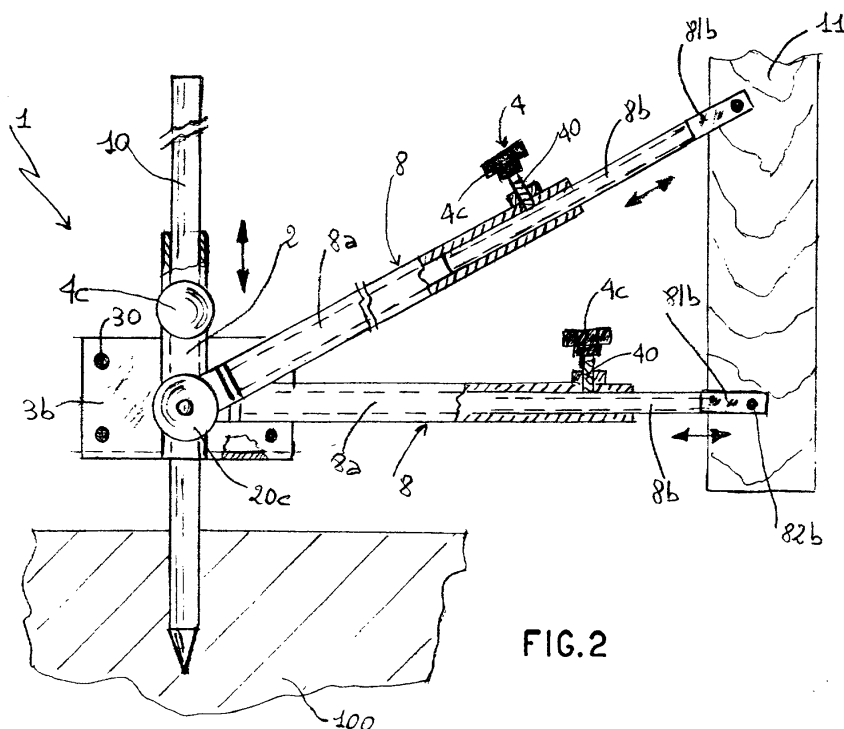


FIG. 2

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Description

[0001] The present invention relates to a supporting and holding device for positioning formworks, recommended in particular for use in the building industry, in metal structural work but also in carpentry or other sectors in which it is necessary to create a support with prefabricated elements to be mounted or to hold boards firmly in precise positions for a certain period of time.

[0002] At the moment, in the building industry for example, when panels must be positioned vertically to create a buffer or prefabricated walling, a builder usually constructs a supporting structure using wooden boards.

[0003] As it is known, to keep the said panels in the position required, the supporting structure currently used is composed of a peg and at least two boards. In more detail, the peg is made by sharpening a piece of waste board from the work site to a point and pushing into the ground at a certain distance from the position of the panel to be mounted. A first board is positioned at ground level, at right angles to the peg and one of its ends is nailed to the peg while the other end is fixed to the panel and a second board is fastened to the panel at one end and diagonally to the other picket at the other end.

[0004] The system just described has some drawbacks.

[0005] A first drawback arises from the fact that, often, the pegs are difficult to plant well and do not remain stable in the ground. In fact, very often, the wood is broken by the blows or, if the ground is pebbly or particularly hard, the point may break. Moreover, the wooden peg does not hold well and is not stable.

[0006] A second drawback arises from the fact that the said boards that are used as pegs are unwieldy and do not always hold the boards correctly, exerting constant pressure on the panel as a whole. This sometimes causes damaging movements of the panel itself which can lead to the work being carried out badly. Moreover, the boards used as pegs have a considerable girth which also makes them a hindrance.

[0007] A further drawback originates from the fact that the wooden material used must almost always be thrown away after it has been used in the support structure, resulting in a waste of material and repercussions on the building costs. In addition to all this, a further increase in the costs caused by the time needed to prepare, for example, the support structure for each panel every time. Furthermore, the support structure is not always built accurately enough for the panel to be positioned exactly vertically since it is very usual for the boards to move or for the nails that fasten them not to hold well, which means the board must be re-positioned and re-nailed, resulting in time wasting.

[0008] Another situation in which pegs and a board are used is during, for example, the building of pavements. In fact at the moment, to prepare the supporting structure for the pouring process when constructing the

stretch of pavement, a series of pegs are planted in the ground with a certain amount of space between them and approximately in position with what will be the edge of the pavement. A wooden board is then nailed to the pegs in position with the lateral edge of the pavement to be constructed.

[0009] Also in this situation, a series of construction difficulties arise and drawbacks are found.

[0010] A first drawback originates in the fact that it is very difficult to plant the pegs in a perfectly straight line in which to lodge the board without problems. In fact, in certain situations it is sometimes necessary to move a peg for a better alignment or because the peg will not hold well enough and so the original lay-out may be ruined, with the consequent alteration of the set-up and the stability of the other pegs.

[0011] A further drawback encountered is the poor stability and hold of the board since it is not always possible to create an accurate lay-out and to fasten it firmly, especially if it is made of aluminium.

[0012] A still further drawback that has emerged is that if, for some reason, the board needs to be released from the pegs, it is not always possible to reuse it. This means a new one must be used and/or more pegs must be prepared. Moreover, also in this construction, the pegs are subject to the same problems as described for the previous system with an additional obstacle in this case being that the position of the pegs is very closely linked to the possibility of the wood breaking and consequently the difficulty in planting the pegs increases further.

[0013] All of this results in time and material being wasted, with the consequent increases in working time and costs.

[0014] An extremely limiting drawback is caused by the difficulty in positioning the nails on the boards because of both the inconvenient position and the often limited working space.

[0015] In addition to everything said so far, it has been found that it is almost impossible to adjust the distance between the board and the peg or between the board and the panel without removing the nails and, consequently, rebuilding the structure.

[0016] It is known that, sometimes, some builders attempt to use a metal peg but fastening the boards to it is much more complicated and the consequent problems of hold, stability, balance and suchlike remain.

[0017] The aim of the present invention is, substantially, to resolve the problems of the commonly-known technique, overcoming the drawbacks described above providing a supporting and holding device for the positioning of formworks which is adjustable and can be easily adapted to fit any distance between the boards or the objects to be held in place and to be supported.

[0018] A further aim of the present invention is to produce a device which can be used an unlimited number of times and which has very small overall dimensions, both in the resting position and the operative position.

[0019] A still further aim of the present invention is to produce a device which can be extended and adjusted and which is lightweight, practical and flexible for various uses in the building industry, in metal structural work, carpentry or suchlike.

[0020] A still further aim of the present invention is to produce a device which is easy to manufacture and works well.

[0021] These aims and others, which will better emerge in the course of this description, are substantially achieved through a supporting and holding device for positioning formworks according to the claims that follow.

[0022] Further characteristics and advantages of the device according to the present invention will better emerge from the detailed description of the supporting and holding device for positioning formworks, according to the present invention, given hereafter with reference to the accompanying drawings, provided in the form of a non-limiting example, in which:

- figure 1 shows a lateral, partially sectioned view of a supporting and holding device according to the present invention;
- figure 2 shows a rear view of the device in the operative mode;
- figure 3 shows a component of the device in detail;
- figure 4 shows a second embodiment of the device in question in operative mode;
- figure 5 shows a third embodiment of the device.

[0023] With reference to the said figures, n°1 denotes an entire supporting and holding device for positioning formworks according to the present invention.

[0024] A first embodiment of the device 1, as shown in figure 1, comprises a first element 2 which is substantially composed of a portion (preferably tubular) designed to come into contact with a peg 10 to be planted in the ground 100, a support element 3 which is fastened irremovably to the first element 2 and constituted of an angular portion composed of a pair of flat elements 3a and 3b positioned at right angles to each other and fastened together at the contact angle.

[0025] The support element 3 is envisaged to create a supporting and clamping point for one or more wooden boards 5 required to fastened together the peg and the panel or structure to be supported and maintain the distance between them in order to allow a perfect plumbline to be realised.

[0026] Furthermore, the flat element 3b is fitted with at least one hole 30 envisaged for the insertion of a nail designed to fasten the board 5 to the support element 3 in a movable way, as shown clearly in figures 1 and 2. In addition to everything described so far, the first element 2 is fitted with at least one threaded hole 2a designed to receive the first clamping means 4 envisaged to fix the said element 2 firmly to the peg 10.

[0027] In accordance with the present invention, the

first clamping means 4 is constituted of a threaded element 40 one end 4a of which is designed to engage in the threaded hole 2a and a second end 4b of which is designed to engage in a clamping element 4c, envisaged to provide a handgrip which is practical and easy for the user of device 1 to handle.

[0028] As shown clearly in figure 1, the first element 2 is fitted with an engaging element 20 comprising a threaded pin, designed to engage in a "bit" 8, which will be described later, or even two "bits". In more detail, the threaded pin 20 has one end 20a fastened irremovably to the first element 2 and the other end 20b designed to engage in a tightening element 20c, which is designed, in it is turn, to engage and fasten one or more bits 8 to the first element 2 in a movable way.

[0029] A second embodiment of the device in question comprises a first element 2 also constituted of a tubular portion designed to interact with the peg 10 to be planted in the ground 100.

[0030] In more detail, the element 2 has a threaded hole 2a designed to engage with a threaded element 40 of the clamping means 4 in basically the same way as in the first embodiment.

[0031] According to the present embodiment, at one end 200 of the element 2 there is a quadrangular element 6 positioned at right angles to element 2. In more detail, the element 6 has a hollow section which allows a profile 7 to run inside it, the said profile 7 being substantially parallelepiped and prevented from moving by the tightening means 15 present. The said tightening means 15 is designed to engage with the profile by means of a threaded hole 6a in the element 6.

[0032] In more detail, the tightening means 15 comprises a threaded element 15a, one of whose ends is fastened to a clamping element 15b and the other is designed to engage with the threaded hole 6a to prevent the profile 7 from moving.

[0033] Also in this case, the device comprises a supporting element 3, constituted of an angular portion composed of a pair of flat elements 3a and 3b, which are similar to those present in the embodiment described earlier, and having a free side of the plate 3a equipped with an edge 3c which can be detached vertically and is used to create a fastening for the board 5. The said board 5 is made of wood or aluminium and is used to realise the outline of, for example, a pavement.

[0034] In still further detail, the plate 3b is fastened externally and irremovably to an end 7a of the profile 7, as shown in figure 4.

[0035] Similarly to the plate 3b in the first embodiment, in this case the plate 3b also has at least one hole 30 to allow a nail to pass through and fasten the board to the plate and hold it in a stable position for the time necessary for the work to be carried out. Both plates have four holes.

[0036] As mentioned earlier, and in accordance with all the embodiments, the device 1 also comprises a "bit" 8, telescopic in kind, substantially composed of a first

portion 8a and a second portion 8b in which the second portion 8b is designed to enter and be housed inside the first portion 8a. Moreover, one end 80a of the first portion 8a is fitted with a hooking means 81a envisaged to fasten the "bit" 8 to the first element 2. Likewise, one end 80b of the second portion 8b is fitted with a hooking means 81b to engage the "bit" with the panel 11 to be supported, as shown in figure 2.

[0037] In more detail, the hooking means 81a and 81b are constituted of a small plate fixed to the respective portions 8a and 8b in which each small plate has, respectively, a slot 82a to engage with the engaging element 20 and 82b for the fastening to panel 11.

[0038] Furthermore, the first portion 8a has a threaded hole 8c designed to receive a second clamping means 4 composed of a threaded element 40 which has one end 4a designed to engage with the threaded hole 8c while the other end 4b is designed to engage with a second clamping element 4c.

[0039] In addition to everything described so far, the "bit" 8 is made of metal, preferably steel or galvanised iron but any material is acceptable as long as it is rigid. The said "bit" 8 has two tubular portions with a diameter large enough to allow the second portion 8b to slide inside and through the first portion 8a.

[0040] Lastly, as mentioned earlier, the device 1 comprises one or more pegs 10 constituted of a metal rod with a point for the insertion of the said peg in the ground.

[0041] The clamping and holding device in question is designed to be set from a resting position in which the first element 2 is not fastened to the peg 10 and the supporting element 3 is not bearing a board 5 or any bits 8 to an operative position in which the first element 2 is slid onto a peg 10 planted in the ground and on the supporting element 3 there is a board. In another but still an operative position, the first element 2 is fastened to one end of the one or two bits by means of the engaging element 20 while the corresponding other ends are engaged, for example, with the structure to be supported and kept vertical.

[0042] After this prevalently structural description, the functioning of the invention in question will now be dealt with.

[0043] The supporting and holding device in the resting position is not fastened to the peg and it is not required to support or hold boards, bits or other objects.

[0044] When the device in question is to be used, the first element 2 must simply be slid onto the peg 10 and fastened to this latter at a certain height using the clamping means 4, rotating the clamping element 4c and slightly tightening the threaded element 40 in the hole 2a to prevent the element 2 sliding vertically in the peg 10. At this point, the peg 10 must be planted in the ground 100 in the spot required until it is stable and extremely firm. The clamping means must be loosened and the height of the first element 2 must be adjusted, generally just above ground level, to have a better hold and, using the handgrip, the threaded element must be

tightened again to fasten the element 2 firmly to the peg.

[0045] At this point, if, for example, a supporting structure is required to support the prefabricated panels and hold them in a vertical position, the threaded pin 20 of the engaging element must be passed through the slot 82a in the hooking means 81a of the bit 8 and it must be clamped to the first element 2 by tightening the tightening element 20c. The operation must be repeated as just described for a second bit.

[0046] At this point, the second portion 8b of the bit must be slid outwards, extracting it from the first portion 8a until a suitable length is reached to fasten the free end 80b of the bit to the support structure, formworks, panel or board etc.

[0047] In more detail, a bit is laid out horizontally and adjusted to set the distance between the peg and the support structure, while the other bit is positioned diagonally and adjusted to allow the structure itself to be plumbled.

[0048] Once the device as just described has been set up and the bits are fastened to the support structure, the bits can be lengthened or shortened to ensure the structure is perfectly vertical and then set up other devices in the same way in order to produce the support necessary for the panels to be mounted.

[0049] When, for example, a pavement or a step must be built, the first element 2 must simply be slid onto each peg and locked at a certain height, as described earlier. At least two pegs 10 must then be planted firmly in the ground at a certain distance from what will be the lateral edge of the pavement. The first element 2 is then slid down to just above ground level and the clamping means is tightened to prevent the element 2 moving around the peg.

[0050] At this point, a board 5 must be placed on the plate 30a. The board 5 is held by the edge 31 and, if the operator wishes, it can be fixed to the plate 30b with some nails.

[0051] Sometimes, depending on the characteristics of the ground, it is not always possible to plant the peg in the exact spot required. In this case, after planting the peg where it is possible, to bring the support plate in to position, the profile 7 must simply be slid into the sliding element 6 in position with where the lateral edge of the pavement or step to be built will be and then it must be locked into place with the tightening means 15.

[0052] In this way it is possible to position the board on the plate to realise the outline of the pavement without any hindrances or difficulties since the device can be adjusted both vertically and horizontally with extreme precision and ease, unlike with the commonly-known technique.

[0053] Once the support structure or board is no longer required to be supported or held either for the mounting of the panels or for the construction of pavements, the user simply has to carry out the phases executed earlier but in reverse. In fact, to remove the device from the operative position, the user simply has to loosen the

clamping means and/or the tightening means by rotating the handgrip knobs, and removing the board from the plate and/or sliding the bits from the threaded pin or by sliding the profile backwards.

[0054] At this point, the peg must be removed from the ground and the user can put the device back into the resting position.

[0055] In this way the present invention achieves the aims outlined.

[0056] In fact, the supporting and holding device in question has very small overall dimensions in both the operative and the resting positions and it is easy and quick to both assemble and disassemble.

[0057] The device can be adjusted in terms of height and depth very accurately in order to support a board and/or one or more bits easily and with stability.

[0058] Furthermore, the device, according to the present invention can be used as many times as is necessary, unlike with the commonly-known technique where the boards used were often thrown away after one or just a few uses. Moreover, the device makes it possible to reduce the wastage considerably, in terms of both the wood used and time spent, and also to reduce labour costs.

[0059] Furthermore, the device has shown to hold well in the ground and is notably stable, making it possible to produce an efficient supporting and holding structure.

[0060] A further advantage of the device in question is that it has a notably simple structure and is easy to use, which is also because of the simplicity of the elements of which its structure is composed.

[0061] The device is lightweight, very practical, accurate, efficient and adaptable to a variety of uses in, for example, the building industry, metal structural work carpentry or other fields.

[0062] Naturally, the present invention can be modified and varied and still remain within the framework of the inventive concept which characterises it.

Claims

1. A supporting and holding device for positioning formworks, characterised by the fact that it comprises a first element (2) substantially constituted of a portion (preferably tubular) designed to come into contact with a peg (10) and a support element (3) fastened to the said first element (2) and constituted of an angular portion composed of a pair of flat elements (3a) and (3b) positioned at right angles to each other and reciprocally fastened in position with the contact angle and envisaged to bear and hold a board (5), the said device being designed to be set from a resting position, in which the first element (2) is not fastened to the said peg (10) and the support element (3) is not holding a board (5) to an operative position, in which the first element (2) is slid

onto a peg (10) planted in the ground and on the support element (3) there is a board.

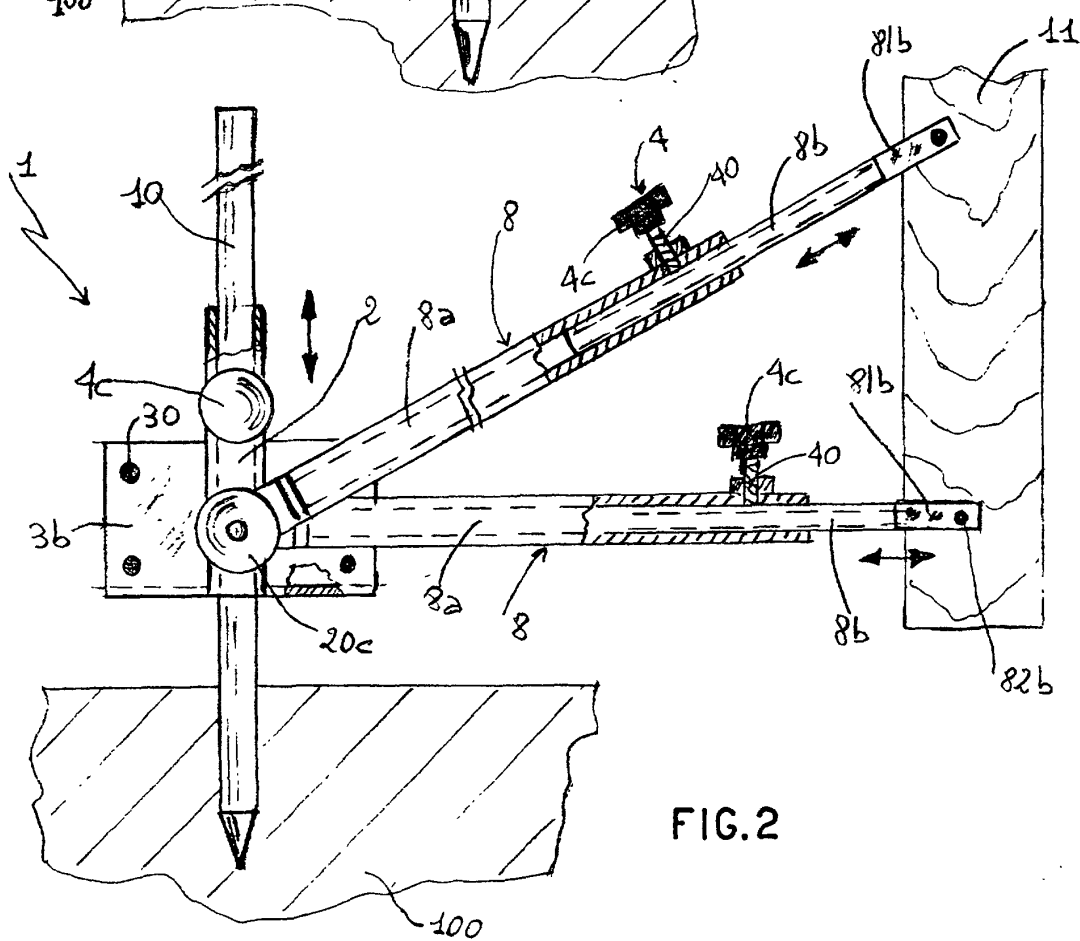
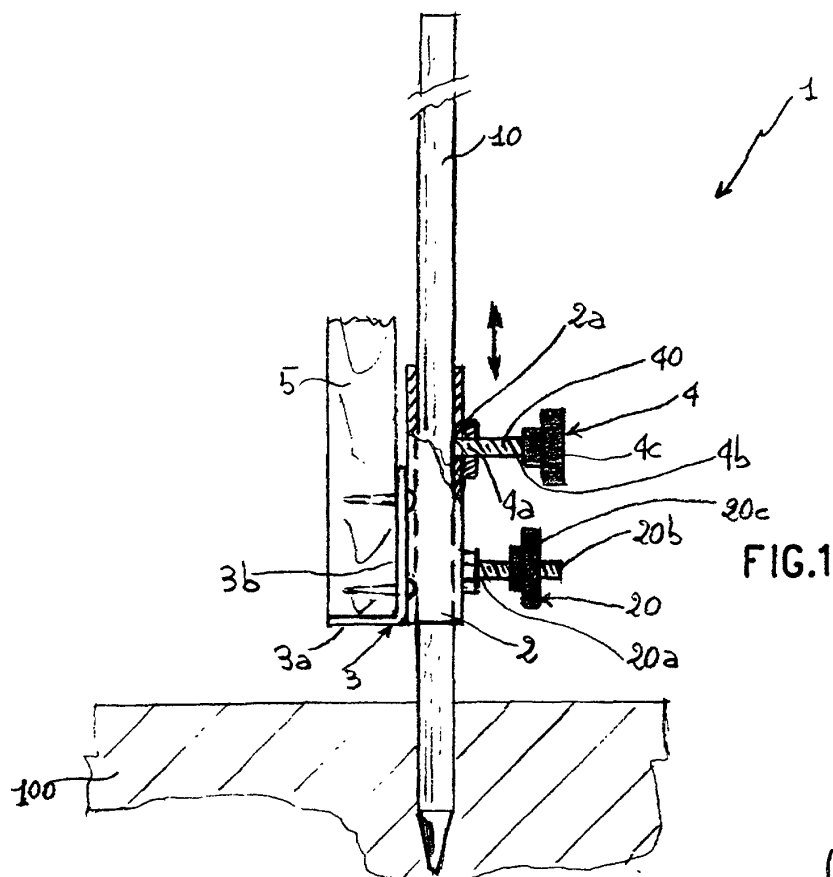
2. A supporting and holding device according to claim 1, characterised by the fact that the said first element (2) is fitted with at least one threaded hole (2a) to receive the clamping means (4) envisaged to fix the said first element (2) to the peg (10).
3. A supporting and holding device according to claim 2, characterised by the fact that the said clamping means (4) is constituted of threaded element (40) which has a first end (4a) designed to engage with the threaded hole (2a) and a second end (4b) designed to engage with a clamping element (4c) envisaged to create a handgrip.
4. A supporting and holding device according to claim 1, characterised by the fact that the first element (2) is fitted with an engaging means (20) comprising a threaded pin which is designed to engage with at least one bit (8).
5. A supporting and holding device according to claim 4, characterised by the fact that the threaded pin (20) has one of its ends (20a) fixed irremovably to the said first element (2) and the other end (20b) is designed to engage with a tightening element (20c) to engage and fasten the said bit (8) to the first element (2) in a movable way.
6. A supporting and holding device according to claim 1, characterised by the fact that one end (200) of the said first element (2) is fastened to a quadrangular element (6) positioned at right angles to the said element (2).
7. A supporting and holding device according to claim 6, characterised by the fact that the said quadrangular element (6) has a hollow section which permits a profile (7), with a substantially parallelepiped form, to slide inside it.
8. A supporting and holding device according to claim 7, characterised by the fact that the said profile (7) is prevented from moving by means of a tightening means (15) designed to engage with the profile by means of a threaded hole (6a) in the quadrangular element (6).
9. A supporting and holding device according to claim 1, characterised by the fact that the said support element (3) has the free side of the plate (3a), the said side having an edge (3c) which can be detached vertically and used to create a fastening for the board (5).
10. A supporting and holding device according to claim

1, characterised by the fact that it comprises a bit (8), substantially composed of a first portion (8a) and a second portion (8b), preferably with a tubular section, since the said second portion (8b) is designed to enter the first portion (8a).

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11. A supporting and holding device according to claim 10, characterised by the fact that the said first portion (8a) has a hooking means (81a) attached to one of its ends (80a), the said hooking means (81a) being constituted of a small plate with a slot (82a) for fastening to the engaging element (20). 10
12. A supporting and holding device according to claim 10, characterised by the fact that the said second portion (8b) has a hooking means (81b) attached to one of its ends (80b), the said hooking means (81b) being constituted of a small plate with a slot (82b) for fastening to the structure to be supported. 15
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13. A supporting and holding device according to claim 10, characterised by the fact that the first portion (8a) is designed to have a threaded hole (8c) to receive a second clamping means (4) composed of a threaded element (40) which has one end (4a) designed to engage with the threaded hole (8c), while the other end (4b) is designed to engage with a second clamping element (4c). 25
14. A supporting and holding device according to claim 8, characterised by the fact that the said tightening means (15) comprises a threaded element (15a) whose end is fixed to a clamping element (15b) and whose other end is designed to engage with the threaded hole (6a) to prevent the profile (7) moving. 30
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15. A supporting and holding device according to claim 1, characterised by the fact that it comprises one or more pegs (10) constituted of a metal rod with a point for the insertion of the said peg into the ground. 40
16. A supporting and holding device according to claim 1, characterised by the fact that the said flat element (3b) has at least one hole (30) for the insertion of a nail designed to fasten the board (5) in a movable way. 45
17. A supporting and holding device according to claim 1, characterised by the fact that it is made of steel, galvanised iron or any rigid material. 50

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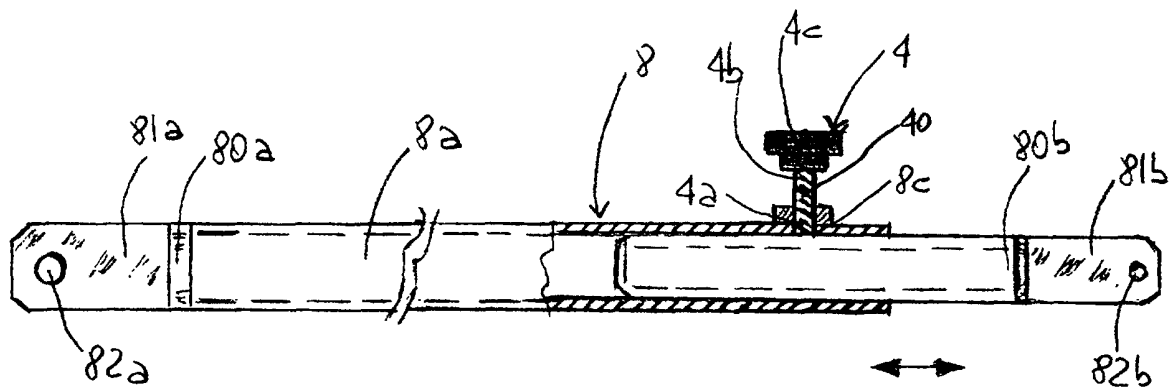


FIG. 3

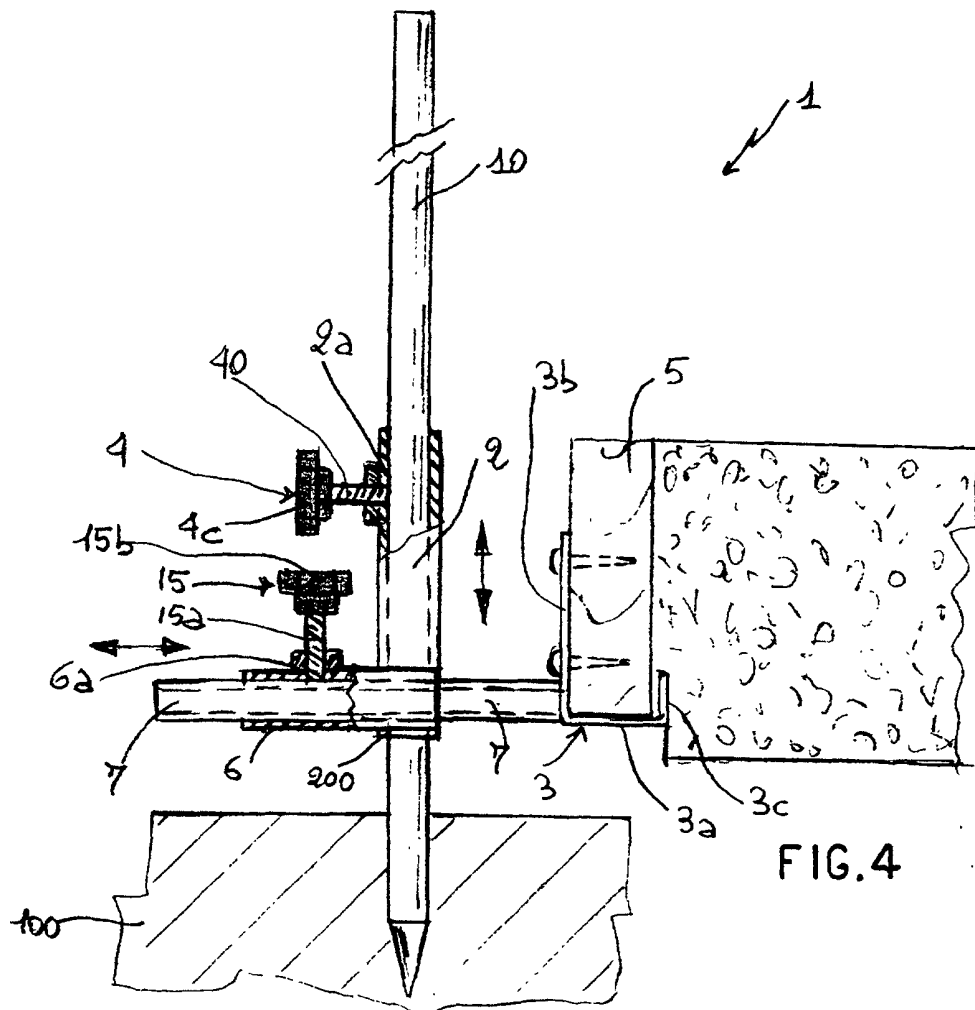


FIG. 4

