



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 327 733 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
16.07.2003 Bulletin 2003/29

(51) Int Cl.7: **E04G 21/32**, E04G 3/00,
E04G 5/04, E04G 5/06

(21) Application number: **03000795.9**

(22) Date of filing: **14.01.2003**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT SE SI SK TR**
Designated Extension States:
AL LT LV MK RO

(72) Inventor: **Savio, Francesco**
30039 Paluello di Stra (VE) (IT)

(74) Representative: **Petraz, Gilberto Luigi et al**
GLP S.r.l.
Piazzale Cavedalis 6/2
33100 Udine (IT)

(30) Priority: **15.01.2002 IT UD20020004**

(71) Applicant: **Savio, Francesco**
30039 Paluello di Stra (VE) (IT)

(54) Module for cantilevered scaffolding

(57) Module for cantilevered scaffolding to be associated with elevated structures (21), such as buildings, bridges, dams or suchlike. The module comprises two base components (11, 12) and assembly and/or accessory components (14-20), able to be selectively associated with the base components (11, 12). The base components comprise a cross-piece (11) arranged substantially horizontal, and an upright (12) arranged substantially vertical and able to support lateral containing elements. The cross-piece (11) has a first seating (26), for a first assembly component (20) defining a through anchorage on a part of the structure (21), and a second seating (22e) for a second assembly component (14) defining a resting anchorage on a part of the structure (21).

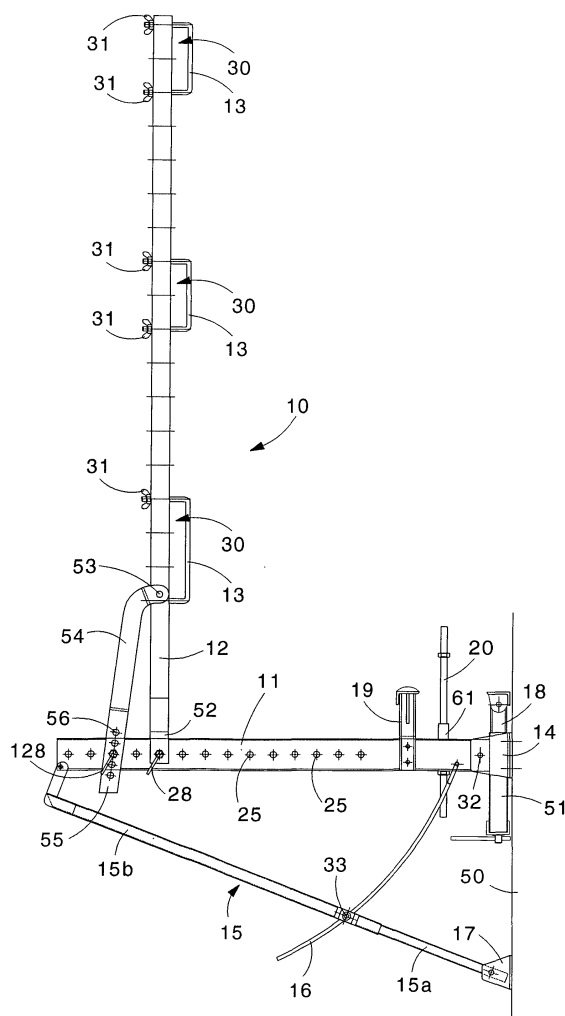


fig. 1

EP 1 327 733 A2

Description

FIELD OF THE INVENTION

[0001] The present invention concerns a module for cantilevered scaffolding of the provisional type employed with the function of a parapet in the execution of works done on elevated structures such as for example buildings.

[0002] In the following description specific reference will be made to the use of the invention in the field of works done on the roofs of buildings, since this is the preferential field of use; however, the module for scaffolding according to the invention can also be used in association with other elevated structures such as bridges, dams, large containers, supports for antennas or suchlike.

BACKGROUND OF THE INVENTION

[0003] Modular cantilevered scaffoldings made by means of a plurality of modules are known: they are used, mainly with the function of a provisional parapet, in the field of works for the construction and/or maintenance of buildings, for example in the case of work to be done on coverings, such as roofs protruding from the vertical walls of buildings.

[0004] Such scaffoldings are substantially divided into two types, both of which have various disadvantages.

[0005] A first type concerns scaffoldings which are anchored to the building by means of screw anchors or similar means, attached by means of making holes in the vertical walls.

[0006] Such scaffoldings cannot be used in several circumstances such as for example when the roofs have cornices, or pitches, with great overhangs, or in cases when it is necessary to make the anchorage on decorated or finished surfaces.

[0007] Moreover, they are inconvenient because of the large number of holes which have to be made on the building and the precarious nature of the anchorage, in some cases. The holes made are visible and have to be covered after the parapet has been removed.

[0008] Cantilevered scaffoldings of the second type, on the contrary, are anchored to the building by vice means.

[0009] In this case the disadvantages are the lack of security and above all the considerable bulk of the anchoring system which prevents, in particular cases, the completion of the works, especially those which have to be made on the roof. For example, in the case of a gutter being replaced, the scaffolding is attached by vices to the cornice or the overhanging part of the roof, but this prevents free access to the edge of the roof where there is the gutter. The same happens in the event of maintenance of the covering of the roof.

[0010] Modules for cantilevered scaffolding of a conventional type therefore allow only one method of an-

chorage to the structure and hence cannot be used universally, which entails the need for users to equip themselves with a plurality of different modular systems according to the circumstances in which they have to operate.

[0011] The present Applicant has devised and embodied this invention to overcome these shortcomings of the state of the art and to obtain further advantages.

10 SUMMARY OF THE INVENTION

[0012] The present invention is set forth and characterized essentially in the main claim, while the dependent claims describe other innovative characteristics of the invention.

[0013] The purpose of the invention is to provide a module for cantilevered scaffoldings of a provisional type which is simple, versatile and not bulky, so that it can be used substantially in association with any type of structure or civil or industrial building, with different anchoring methods, allowing in all circumstances easy access for the workers to the site of the work.

[0014] Another purpose of the invention is to achieve a safe and reliable module for cantilevered scaffoldings which comprises a limited number of components and is practical and quick to assemble, dis-assemble and reconfigure in its different conditions of use.

[0015] In accordance with such purposes, the module for cantilevered scaffoldings according to the invention comprises two base components which can be selectively associated with a plurality of assembly and/or accessory components according to the type of anchorage to be made on the building, or structure, with which the scaffolding has to be associated.

[0016] The base components are: a cross-piece, arranged substantially horizontal during use, and an upright, arranged substantially vertical during use and provided with at least a supporting bracket, or other analogous element, advantageously two or more, distanced vertically, for longitudinal blocking and containing elements with a safety function, such as boards, planks, metal plates, staffs or similar.

[0017] According to the invention, the cross-piece is provided with at least a first seating for a first assembly component defining an anchorage of the through type on a structural part of the building, to be more exact on a protruding segment of the covering, and a second seating for a second assembly component defining an anchorage resting on one surface of the building, for example on a segment of vertical or substantially vertical wall.

[0018] In this way, according to the type of building with which the scaffolding has to be associated and the constructional characteristics thereof, one and/or the other assembly component is/are used, keeping the other components of the module substantially unchanged.

[0019] The presence of a through anchorage on the protruding segment of the covering allows to assemble

the module according to the invention substantially irrespective of the width of the cantilevered part of the covering, therefore guaranteeing a stable anchorage in any condition. On the contrary, in the case wherein, for example, the covering protrudes little or not at all from the vertical wall, the resting anchorage is used, or even the resting anchorage together with the through anchorage, thus increasing the flexibility of use of the module according to the invention. The resting anchorage can be used in combination with the through anchorage also when there are particular conditions of stress, or on wall structures having little or difficult gripping capacity.

[0020] According to a variant, the module comprises accessory components able to improve the stability and positioning of the scaffolding to be made, and to improve its adaptability and capacity to adjust to the different conditions in which it finds itself operating, in any case keeping high standards of safety for the operator and ensuring easy and rapid assembly. Such accessory components consist at least of spacer means and brace means, with relative adjustment means and means to attach them to the cross-piece and/or upright.

[0021] The module for cantilevered scaffoldings according to the invention not only provides a limited number of base components which make it extremely practical and economical, but also has characteristics of considerable versatility and can therefore be used universally, substantially in any field of installation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] These and other characteristics of the present invention will become apparent from the following description of a preferential form of embodiment, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 shows a side view of a module for cantilevered scaffoldings according to the invention with all its components;
- figs. 2a and 2b show a front side view of the horizontal component, or cross-piece, of the module shown in fig. 1;
- figs. 3a and 3b show a front side view of the vertical component, or upright, of the module shown in fig. 1;
- figs. 4a and 4b show a front side view of a first accessory component of the module shown in fig. 1;
- figs. 5a and 5b show a front side view of an adjustment rod of the module shown in fig. 1;
- fig. 6 shows the through assembly component of the module shown in fig. 1;
- figs. 7a and 7b show a front side view of a second accessory component of the module shown in fig. 1;
- figs. 8a and 8b show a front side view of a third accessory component of the module shown in fig. 1;
- figs. 9a and 9b show a side view from above of a

first flange element associated with the horizontal cross-piece for the resting anchorage of the module shown in fig. 1;

- figs. 10a and 10b show a side view from above of a second flange element associated with the first accessory component of the module shown in fig. 1;
- fig. 11 shows a side view of an element to attach the containing safety elements of the module shown in fig. 1;
- figs. 12-20 show some examples of use of the module shown in fig. 1.

DETAILED DESCRIPTION OF A PREFERENTIAL FORM OF EMBODIMENT

[0023] With reference to the attached drawings, a module 10 for cantilevered scaffoldings according to the invention comprises a plurality of components 11-20 which can be selectively associated with each other in differentiated fashion so as to make cantilevered scaffoldings of different compositions according to the type of building 21 with which they have to be associated.

[0024] In order to make such scaffoldings, a plurality of such modules 10 are associated in series with the building 21 and aligned with each other, so as to create a modular structure which develops for a desired perimeter segment of the zone in which work is to be carried out.

[0025] The module 10 comprises two base components which are always used: a cross-piece 11 and an upright 12 with C-shaped brackets 13. The brackets 13 are made of terminally threaded bars and are used to attach the boards or planks, not shown here, which have a containing function for the safety of the operators; the bracket 13 located at the lowest point is bigger than the others in order to accommodate higher planks functioning as a foot protection element. There is also a first flange 14 which, for reasons of practicality, always stays associated with one end of the cross-piece 11, that is, the one associated with the vertical wall 50 of the building 21 (figs. 12-20), although it is not necessary in all applications.

[0026] The cross-piece 11 (figs. 2a and 2b) is the component which is always anchored to the building 21 and consists of a tubular profile inserted into a mating through aperture 27 made on the lower part of the upright 12 and defined by two blades 52 welded to the lower part of the upright 12 (fig. 3a).

[0027] The cross-piece 11 has a square tubular profile 51 welded, during use, vertically and located in proximity with its rear end, that is, the end facing towards the building 21; the square tubular profile is closed at the bottom part by a U-shaped profile 57 on which is mounted rotatable a threaded bar which is arranged inside the square tubular profile 51 and which can be driven by means of a manoeuvring rod 58 for the function described hereafter.

[0028] The cross-piece 11 also has a round tubular

profile 61 with a vertical axis, arranged during use in its rear part (fig. 2b) and defining a through hole 26. The function of the round tubular profile 61 is to contain a threaded bar 20 for through assembly with the protruding part of the roof, as will be described in more detail hereafter.

[0029] It also has five holes 22a-22e, arranged during use with a substantially horizontal axis, of a through type: the first hole 22a is located substantially at its front end, the other four 22b-22e are arranged in its rear part, and serve for the assembly of assembly and/or accessory components, as will be described hereafter. There are also, substantially along the front 3/4 of the length of the cross-piece 11, a plurality of holes 25 which serve for the assembly, in a variable position, of the upright 12.

[0030] The upright 12 (figs. 3a and 3b) also consists of a tubular profile and can be selectively clamped in the desired position along the cross-piece 11, in this case by means of a threaded pin 28 which is made to pass through any one as chosen of said holes 25 and through mating holes 62 made on said parallel blades 52 in the lower part of the upright 12 itself. One of the two holes 62 present in said blades 52 is threaded in order to clamp the pin 28 by means of nut and bolt.

[0031] An adjustment rod 54 is associated with the upright 12 and allows to adjust the inclination of the upright 12, with extreme precision, with respect to the cross-piece 11. The adjustment rod 54 is attached with its upper end, by means of a substantially horizontal pin 53, to the upright 12 and is connected to the cross-piece 11 by means of two blades 55 present at its lower end. On the blades 55 there are pairs of holes 56 with a substantially horizontal axis, of which one per pair is threaded, said pairs being arranged one above the other in order to attach the rod 54 in the desired position to the upright 12 by means of a relative pin 128.

[0032] To adjust the inclination of the upright 12 with respect to the cross-piece 11 according to the type of protruding part, or building 21, on which the module 10 is applied, it is sufficient to release the pins 28, 128, attach the rod 54 to the cross-piece 11 choosing the suitable pair of holes 56, orient the upright 12 with respect to the rod 54, inclining it with respect to the pin 53 and then clamp the upright 12 by means of the relative pin 28.

[0033] Starting from its top and for almost its entire height, the upright 12 has a series of horizontal through holes 29, advantageously aligned with each other and equidistant, in correspondence with which the brackets 13 are attached in the desired position.

[0034] The brackets 13, in fact, have threaded ends 13a which can have a variable interaxis, as shown in fig. 1, but in any case equal to a multiple of the interaxis between the through holes 29. In this way the brackets 13 are inserted at different heights inside the through holes 29 with the threaded ends 13a which, protruding from the upright 12, allow suitable wing nuts 31 to be screwed in, which thus achieve the clamping thereof.

[0035] Each bracket 13 thus defines a seating 30 inside which a relative longitudinal element to contain the scaffolding can be inserted, such as for example a wooden shaft or an aluminum rod.

[0036] The flange 14 (figs. 9a and 9b) comprises two angle bars 14b provided on one side with holes for means to anchor the flange to the building 21 and on the other side with respective through holes 32, aligned with each other. The two angle bars 14b are joined by a plate 14a and between them there is the cross-piece 11 with the horizontal hole 22e aligned with the holes 32.

[0037] The flange 14 and the cross-piece 11 can be positioned at a variable angle, according to the specific requirements of the application, for example to rest on inclined cornices 47 (fig. 20), and can be reciprocally clamped by means of a screw element, such as for example a bolt, inserted inside the holes 22e and 32.

[0038] The remaining components 15-20 of the module 10, which can be used or not according to the circumstances, comprise: a brace 15, an adjustment rod 16, a second flange 17, a first 18 and a second 19 spacer and an anchorage bar 20.

[0039] The second flange 17 (figs. 10a and 10b) comprises two angle bars 17b joined by a plate 17a and provided on one side with holes for means to anchor the flange to the building 21 and on the other side with respective through holes 35, aligned with each other.

[0040] As will be shown hereafter, the two flanges 14 and 17 can be anchored to or merely rested on the building 21, according to the type of scaffolding to be made.

[0041] The brace 15 consists of two tubular profiles, inner 15a and outer 15b, telescopically associated together and able to be selectively clamped in the desired axial position by means of a wing nut 33 mounted on the outer tubular profile 15b. The latter has the free end conformed as a fork with a hole 34 able to be coupled with the horizontal hole 22a of the cross-piece 11, while the inner tubular profile 15a has a through hole 36 at the free end.

[0042] The brace 15 is assembled by constraining the free end of the outer tubular profile 15b to the front end of the cross-piece 11, by means of a clamping pin inserted through between the holes 22a and 34, and the free end of the inner tubular profile 15a to the second flange 17, by means of a clamping pin arranged through between the holes 35 and 36. In this way, the second flange 17 and the brace 15 can also be positioned and reciprocally clamped at various angles.

[0043] The adjustment rod 16, with a curved conformation, has a hook-like shaping 16a at its upper end which can be inserted into the horizontal hole 22d of the cross-piece 11 and clamped with respect to the latter by means of a pin inserted into a mating hole made on the same upper end. The lower end, on the contrary, can be inserted and slide inside a through hole made on the outer tubular profile 15b of the brace 15, in correspondence with the wing nut 33 by means of which the adjustment rod 16 and the inner tubular profile 15a are

clamped at the desired point.

[0044] In this way, the adjustment rod 16 can be installed to connect the cross-piece 11 to the brace 15, whatever the position assumed by the latter.

[0045] The spacers 18 and 19 can be associated substantially orthogonally with the cross-piece 11 and are able to act through interference on an upper supporting surface, to make the cross-piece 11 more stable and improve the horizontal positioning thereof.

[0046] The first spacer 18 comprises a square tubular profile 63 arranged vertically during use inside the square tubular profile 51. The square tubular profile 63 has at the lower part a bushing 40 on which the threaded bar 37 is able to be screwed. The upper end of the square tubular profile 63 is connected to a support 38, and an L-shaped profile 39 is associated to the upper part thereof and arranged transversely with respect to the square tubular profile 63. Acting on the threaded bar 37 by means of the manoeuvring rod 58 it is possible to adjust the spacer 18 in height according to the requirements of resting on the lower part of the protrusion of the roof (figs. 12-14, 16) until the L-shaped profile 39 correctly abuts against the desired part of the roof. The support 38 is advantageously pivoting around a pin 60 with respect to the square tubular profile 63 so that it can also adapt to the different inclinations of the protrusion of the roof.

[0047] The second spacer 19 comprises a support 41 above which a buffer 43 is assembled. At the lower part the support 41 has two blades 42 which have respective holes 59, aligned with each other, in order to attach the support 41 to the cross-piece 11 by means of nuts and bolts which are inserted into the holes with the horizontal axis 22b and 22c.

[0048] The anchor bar 20, of the threaded type, functions as a connection between the cross-piece 11 and a protruding part of the building 21, such as the protruding part of a slope 46 or a cornice 47 and serves as an assembly component of a through type to assemble the whole module 10 to the roof of the building 21.

[0049] In order to install the anchor bar 20 it is necessary to prepare a through hole on the protruding part 46 or 47 of the building 21. The anchor bar 20 is then inserted through into the vertical axis hole 26 of the cross-piece 11 and into the hole of the protruding part 46 or 47; it is then clamped on the latter and on the cross-piece 11, in this case with two screw nuts 48 and 49. The anchor bar 20 can be solidly associated at the lower end to a rod, a wing nut or suchlike, which makes it easier to screw and unscrew.

[0050] Figs. 12-20 show some possible applications of the module 10 to buildings 21 of different types; as we have said, the components which are always present in all solutions are the cross-piece 11, the upright 12, with the relative brackets 13, and the first flange 14.

[0051] According to the constructional characteristics of the building 21, the module 10, and in particular the cross-piece 11, is associated either by means of the an-

chor bar 20, or alternatively by means of the flanges 14 and 17, or with both such elements.

[0052] In fig. 12, the cross-piece 11 is attached to the protruding part of the slope 46 by means of the anchor bar 20, with the aid of the two spacers 18 and 19; in this solution no component is attached to the wall 50 which is thus kept completely integral.

[0053] In fig. 13, the lower part of the slope 46 is horizontal, and therefore the spacer 18 is adjusted to guarantee a better support.

[0054] In the solution shown in fig. 14, where the slope 46 is thinner and shorter, the cross-piece 11 is also associated with the brace 15, which rests on the wall 50 by means of the second flange 17, and on the adjustment rod 16.

[0055] The case shown in fig. 15 refers to a situation wherein the building 21 has only a very limited perimeter cornice 47, which implies that it is impossible to use the through anchorage bar 20; attachment is achieved by means of the flanges 14 and 17 resting on the wall 50.

[0056] Fig. 16 shows the case of a building 21 with a more protruding perimeter cornice 47, with respect to which the anchor bar 20 is inserted through; however, the flanges 14 and 17 resting on the wall 50 are also used.

[0057] In fig. 17, on the contrary, the cross-piece 11 is anchored with dowelling to the cornice 47 by means of the first flange 14 only, and is associated with the brace 15, with a relative adjustment rod 16, attached to the wall 50 by means of the second flange 17.

[0058] Figs. 18, 19 and 20 show further applications of the module 10 with the lateral resting anchorage of both flanges 14 and 17 on the wall 50, and with the upright 12 attached in a different position along the cross-piece 11.

[0059] In the embodiment shown in fig. 20, both the cross-piece 11 and the brace 15 are associated with a cornice 47, respectively by means of dowelling of the first flange 14 and the second flange 17.

Claims

1. Module for cantilevered scaffolding to be associated with elevated structures (21), such as buildings, bridges, dams or suchlike, on which work has to be done, said module being able to be anchored to said elevated structures (21), together with one or more modules identical thereto, to define the scaffolding to be achieved, **characterized in that** it comprises two base components (11, 12) and a plurality of assembly and/or accessory components (14-20), able to be selectively associated with said base components (11, 12), said base components comprising at least a cross-piece (11) arranged substantially horizontal during use, and an upright (12) arranged substantially vertical during use and able to support lateral containing elements, said cross-piece (11)

- having at least a first seating (26), for a first assembly component (20) defining an anchorage of a through type on a part of said structure (21), and a second seating (22e) for a second assembly component (14) defining an anchorage of the type resting on a part of said structure (21).
2. Module as in claim 1, **characterized in that** said first assembly component (20) of the through type is able to cooperate with a protruding segment of the roof.
 3. Module as in claim 1, **characterized in that** said second assembly component (14) of the resting type is able to cooperate with a vertical or substantially vertical segment of wall (50).
 4. Module as in claim 1, **characterized in that** said upright (12) can be clamped in a plurality of positions on said cross-piece (11) and has a plurality of seatings (29) to attach, at different heights, relative brackets (13) able to support said lateral containing elements.
 5. Module as in claim 4, **characterized in that** said upright (12) can be inclined with respect to said cross-piece (11) by means of an adjustment rod (54).
 6. Module as in any claim hereinbefore, **characterized in that** said first seating consists of a through hole (26) with a substantially vertical axis made on said cross-piece (11) and that said first assembly component comprises a threaded bar (20) able to be inserted inside said hole (26) and a mating hole made on said structure (21), said bar (20) cooperating with mating clamping means (48, 49) to anchor said cross-piece (11) on said structure (21).
 7. Module as in any claim hereinbefore, **characterized in that** said second assembly component comprises flange means (14) able to rest on and/or be attached on a vertical or substantially vertical part of said structure (21).
 8. Module as in claim 7, **characterized in that** said flange means (14) are connected in pivoting fashion to one end of said cross-piece (11).
 9. Module as in any claim hereinbefore, **characterized in that** said accessory components comprise brace means (15) able to be constrained at one end to said cross-piece (11) and at the other end to mating flange means (17) suitable to rest on and/or be attached to said structure (21).
 10. Module as in claim 9, **characterized in that** said brace means (15) comprise two parts (15a, 15b) associated telescopically and able to be selectively clamped together, so as to be able to assume a variable extension and inclination.
 11. Module as in claim 9 or 10, **characterized in that** said accessory components comprise adjustment rod means (16) able to connect said cross-piece (11) to said brace means (15).
 12. Module as in claim 11, **characterized in that** said adjustment rod means (16) have one end conformed as a hook able to be inserted and clamped in a mating hole (22d) made on said cross-piece (11) and the other end able to be inserted and clamped on said brace means (15).
 13. Module as in any claim hereinbefore, **characterized in that** said accessory components comprise spacer means (18, 19) able to be constrained on said cross-piece (11) and to act through interference on a protruding supporting surface of said structure (21).
 14. Module as in claim 13, **characterized in that** said spacer means (18, 19) comprise at least a support (38, 41) for a profile (39) or a buffer (43), able to be arranged in abutment against said supporting surface.
 15. Module as in claim 13 or 14, **characterized in that** at least one (18) of said spacer means comprises bushing means (40) cooperating with a threaded bar (37) associated with said cross-piece (11) and able to be selectively screwed onto said bushing means (40) in order to vary the height of said spacer means (18).

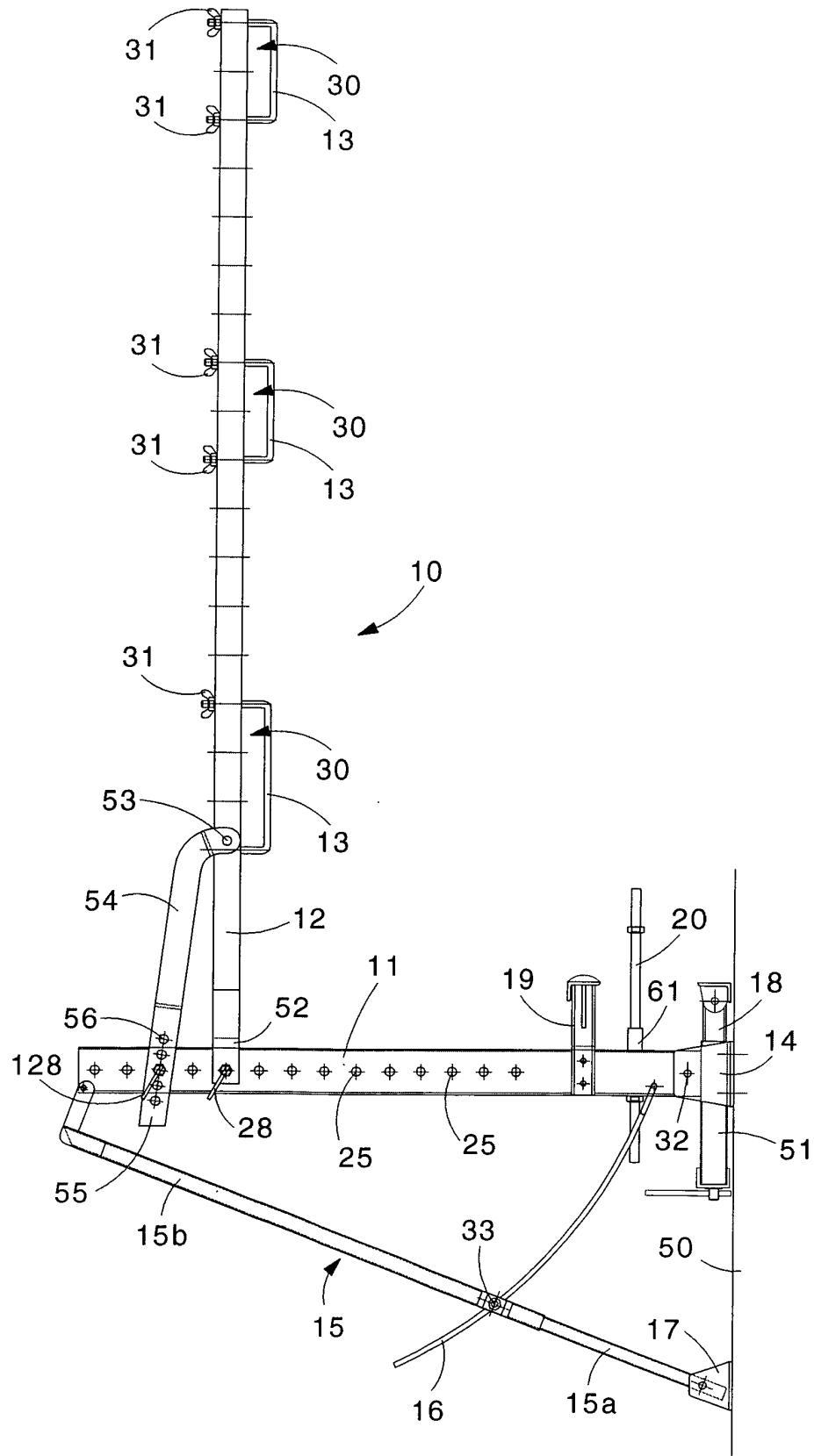
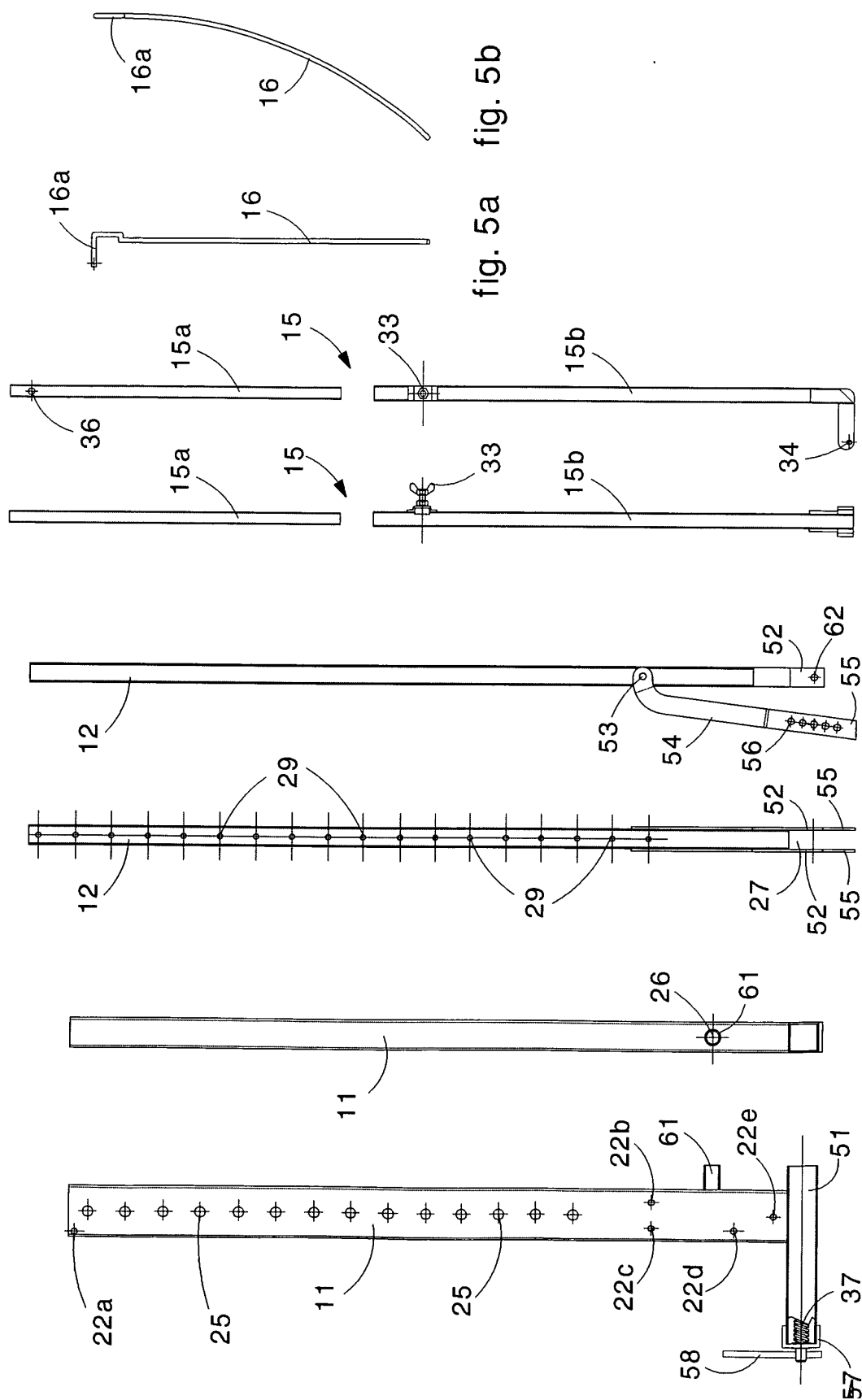


fig. 1



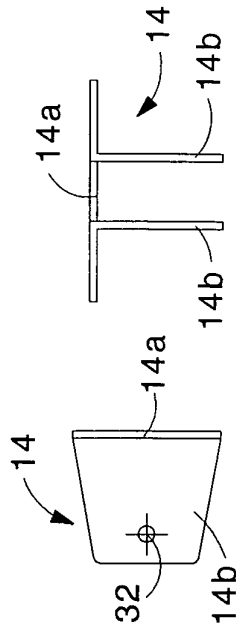


fig. 9a

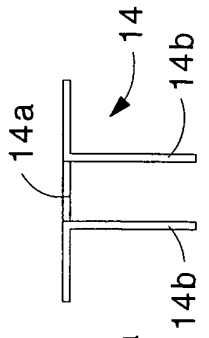


fig. 9b

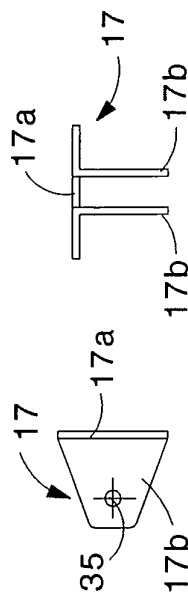


fig. 10a

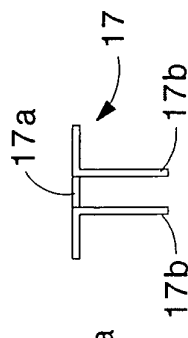


fig. 10b

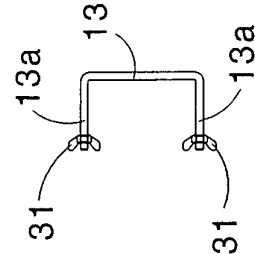


fig. 11

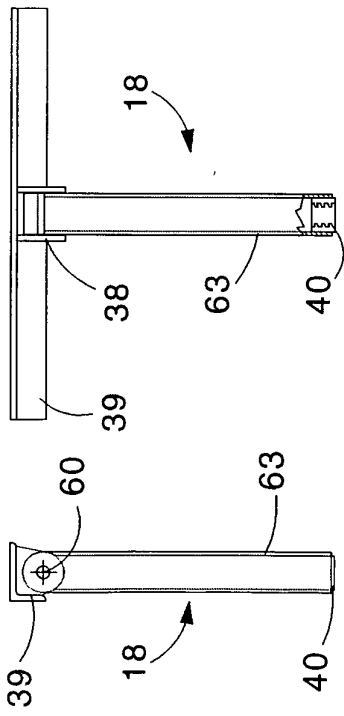


fig. 7a

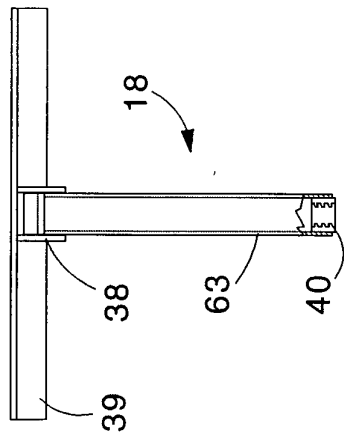


fig. 7b

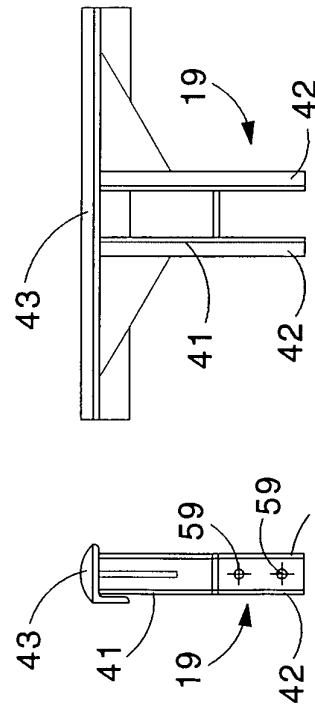


fig. 8a

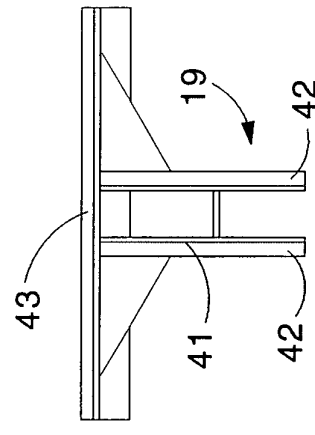


fig. 8b

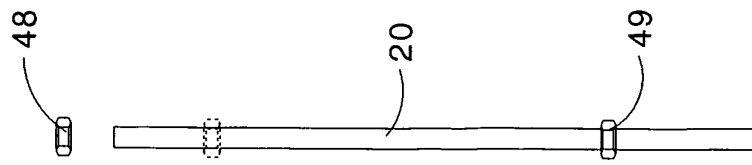


fig. 6

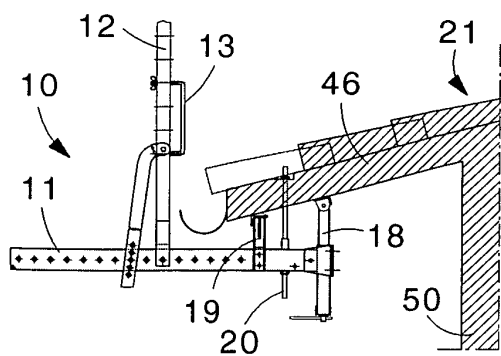


fig. 12

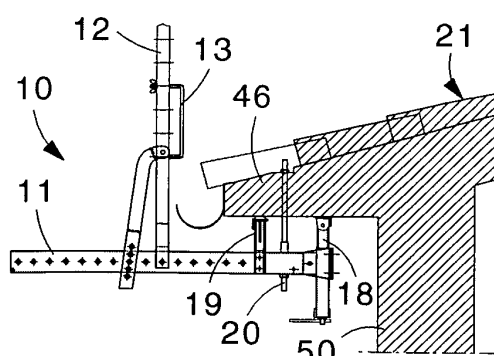


fig. 13

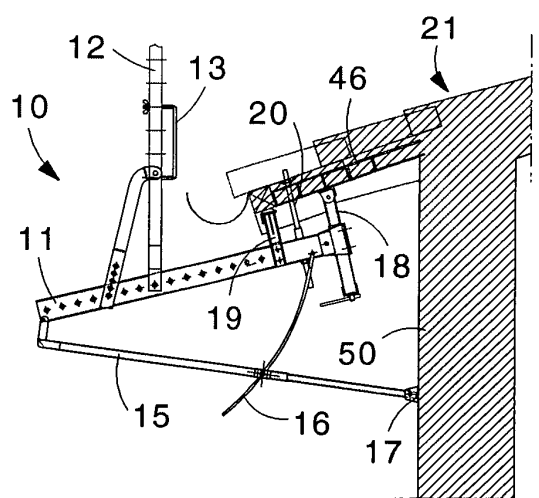


fig. 14

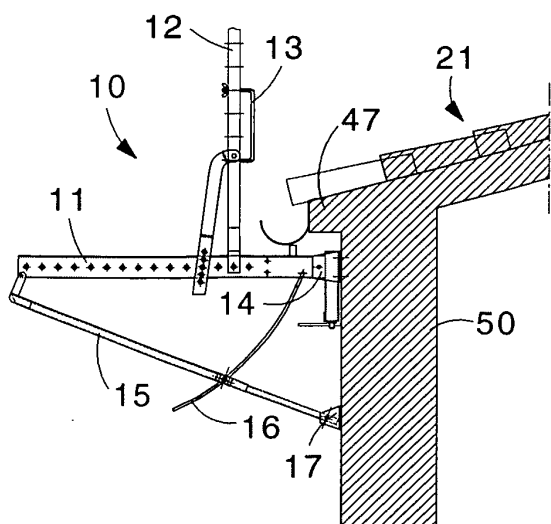


fig. 15

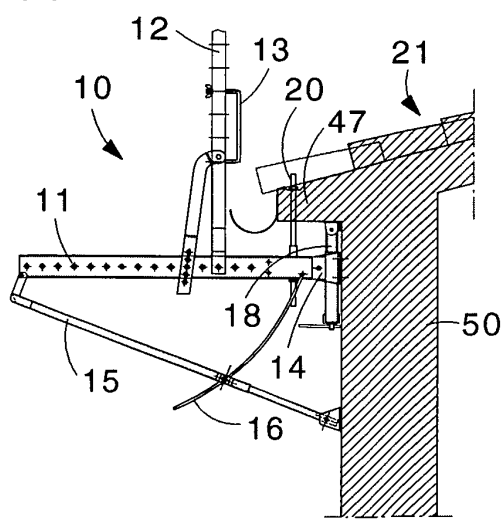


fig. 16

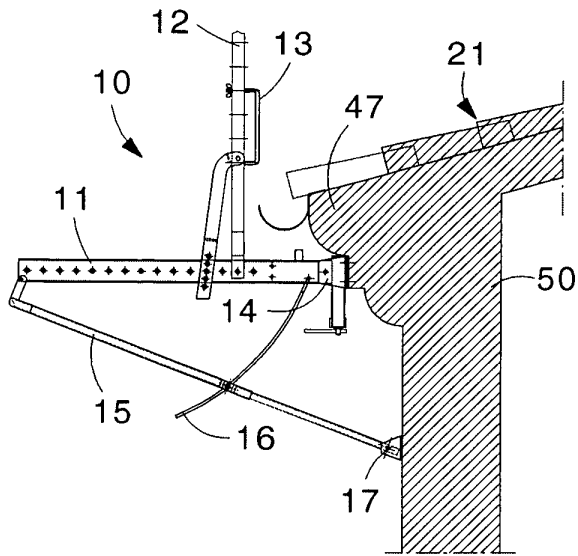


fig. 17

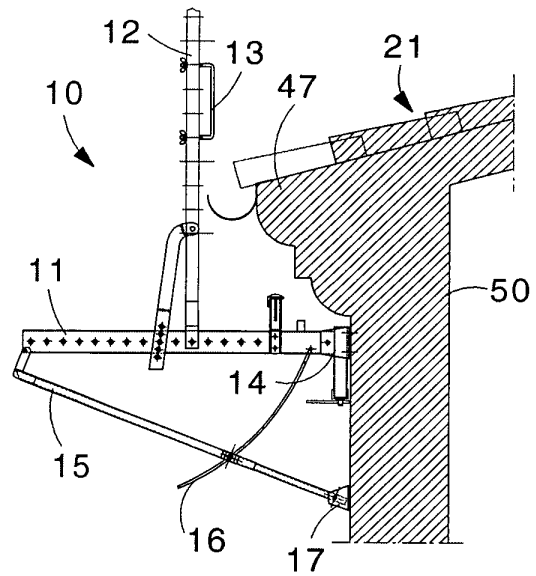


fig. 18

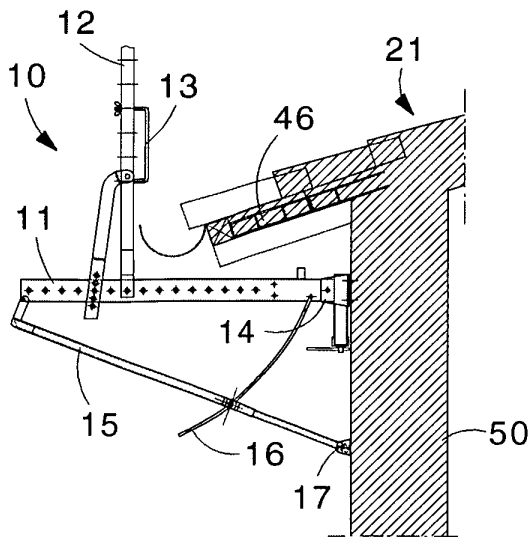


fig. 19

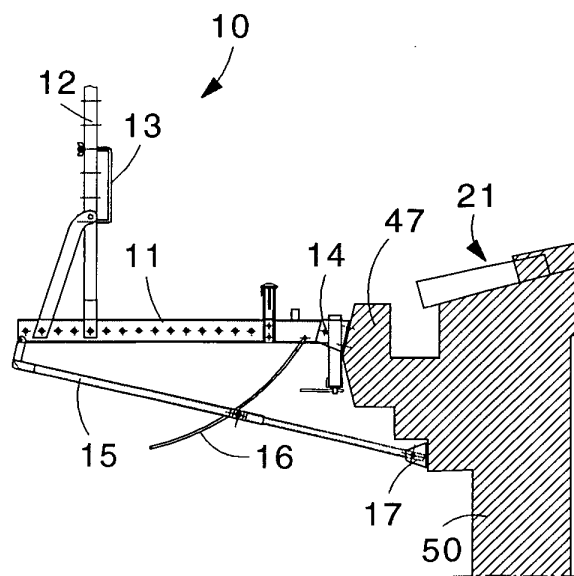


fig. 20