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(71) Applicant: **Faresin Building Division S.p.A.**
36042 Breganze (VI) (IT)

(72) Inventor: **FARESIN, Guido**
36061 BASSANO DEL GRAPPA VI (IT)

(74) Representative: **Modiano, Micaela Nadia et al**
Modiano & Partners
Via Meravigli, 16
20123 Milano (IT)

(54) SUPPORTING DEVICE, OF THE FALLING HEAD TYPE, FOR SUPPORTING BEAMS OF FORMWORK FOR FLOOR SLABS

(57) A supporting device, of the falling head type, for supporting beams of formwork for floor slabs, comprising a post (11), to be fixed to the end of a supporting prop rested on the ground, and a supporting head (15), coupled to the post (11), for at least one supporting beam (16) of formwork for floor slabs; the supporting head (15) comprises in turn: two plates (18) arranged mirror-symmetrically, adjacent to opposite sides of the post (11), and adapted to delimit laterally two accommodation regions (19) of the ends of two supporting beams (16); at least two pairs of recesses (23, 24), each one for guiding insertion and containment for a resting portion (25) of the corresponding supporting beam (16), formed by opposite parts of the post (11); each recess (23a, 24a) of each pair is formed on a respective plate (18) and mirror-symmetrically to the other recess (23b, 24b) of the same pair, and the bottom of each recess (23a, 23b, 24a, 24b) forms at least part of the supporting surface of the resting portion (25) of the corresponding supporting beam (16); at least two pairs of recesses (23, 24) are provided, with respect to each other, at different heights, forming guides for the resting portions (25) of the respective supporting,beams (16) to be installed at different heights from the ground.

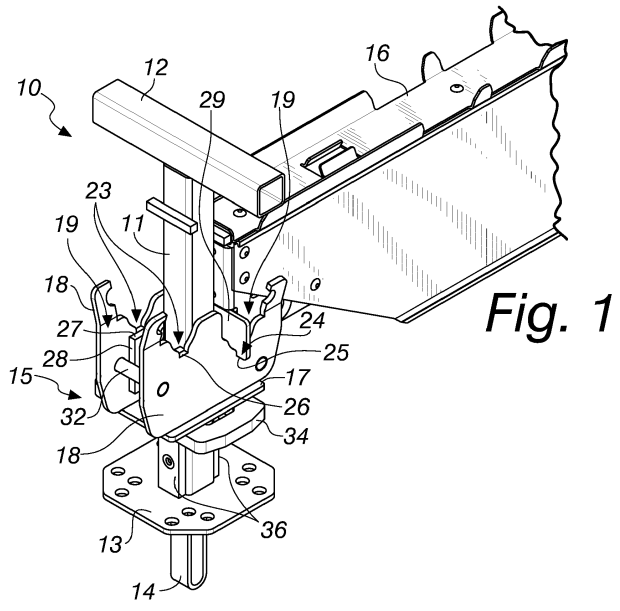

Fig. 1

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Description

[0001] The present invention relates to a supporting device, of the falling head type, for supporting beams of formwork for floor slabs.

[0002] Supporting devices to be used in the provision of floor slabs are known which comprise a post to be fixed to the end of a supporting prop that rests on the ground and a supporting head for at least one supporting beam of a formwork panel, coupled along the post.

[0003] According to some known solutions, the supporting head comprises two plates which are arranged mirror-symmetrically and laterally adjacent to opposite sides of the post, in order to delimit a region for accommodating the ends of the supporting beams, and two symmetrical pairs of recesses provided on the plates, each for the insertion of an end portion of a supporting beam.

[0004] These supporting devices have a significant drawback in that their use is limited to a single type of formwork panel, preventing the use of different types, in particular as regards their thickness.

[0005] Using panels of different thickness makes it in fact impossible to arrange them side by side in a coplanar manner, as normally required in the provision of a floor slab.

[0006] The aim of the present invention is to provide a supporting device of the falling head type that is capable of obviating the cited drawback, allowing the use of formwork panels of different thickness during the provision of a floor slab.

[0007] Within this aim, an object of the invention is to provide a supporting device that is structurally simple and resistant to loads.

[0008] A further object of the invention is to provide a supporting device of the falling head type for supporting beams of formwork for floor slabs that is easy to use.

[0009] Another object is to provide a supporting device of the falling head type for supporting beams of formwork for floor slabs that can be manufactured with known systems and technologies.

[0010] This aim, as well as these and other objects that will become better apparent hereinafter, are achieved by a supporting device, of the falling head type, for supporting beams of formwork for floor slabs, comprising a post, to be fixed to the end of a supporting prop rested on the ground, and a supporting head, coupled to said post, for at least one supporting beam of formwork for floor slabs, said supporting head comprising in turn:

- two plates arranged mirror-symmetrically, adjacent to opposite sides of said post, and adapted to delimit laterally two accommodation regions of the ends of two supporting beams,
- at least two pairs of recesses, each one for guiding insertion and containment for a resting portion of the corresponding supporting beam, formed by opposite parts of said post, each recess of each pair being formed on a respective one of said plates and mirror-symmetrically to the other recess of the same pair, the bottom of each recess forming at least part of the supporting surface of said resting portion of the corresponding supporting beam,

said device being characterized in that said at least two pairs of recesses are provided, with respect to each other, at different heights, forming guides for the resting portions of the respective supporting beams to be installed at different heights from the ground.

[0011] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the supporting device according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of a device according to the invention, with a supporting beam for formwork for floor slabs associated therewith;
Figure 2 is a front view of the device according to the invention;
Figure 3 is a side view of the device according to the invention;
Figure 4 is a top view of the device according to the invention;
Figure 5 is a side view of the device according to the invention, with two supporting beams for formwork for floor slabs associated therewith;
Figure 6 is a view of a first example of use of the device according to the invention, after the application of formwork panels to the supporting beams;
Figure 7 is a view of a second example of use of the device according to the invention, after the application of formwork panels to the supporting beams;
Figure 8 is a view of a third example of use of the device according to the invention, after the application of formwork panels to the supporting beams.

[0012] With reference to the cited figures, the device according to the invention is generally designated by the reference numeral 10.

[0013] The device 10 comprises a post 11 to be fixed to the end of a supporting prop that rests on the ground (shown only in Figures 6 to 8, where it is generally designated by the reference numeral 37). The post 11 is tubular, with a square cross-section, and has a T-shaped portion 12 at its upper end.

[0014] At the lower end of the post 11 there is a flat bracket 13 from which a shank 14 protrudes downward which is substantially aligned with the post 11, is to be inserted in the supporting prop 37 and is of the type conveniently provided with a complementary plate to which the flat bracket 13 is to be locked by bolting.

[0015] A supporting head 15 for two supporting beams 16 of formwork for floor slabs is coupled slidingly to the post 11. Figure 1 shows only one supporting beam 16,

while Figure 5 shows both.

[0016] The supporting head 15 comprises, on a base plate 17, two plates 18 that are welded thereto edgeways, are arranged mirror-symmetrically, are laterally adjacent to opposite sides of the post 11 and are adapted to delimit laterally two accommodation regions 19 for the ends of two contiguous supporting beams 16.

[0017] The base plate 17 is provided centrally with a through hole 20 (shown in broken lines in Figure 3) to allow sliding along the post 11; in particular, sliding is allowed along an initial portion 11a of the post 11 comprised between the flat bracket 13 and a pair of stroke limiters 21 arranged on opposite sides of the post 11, in an intermediate portion thereof.

[0018] Means 22 for reversible locking of the supporting head 15 at a preset position defined along the post 11 are associated with said head.

[0019] The supporting head 15 is also provided with two pairs of recesses 23 and 24, each for guiding insertion and containment for a resting portion 25 of the corresponding supporting beam 16, which are formed on opposite sides of the post 11.

[0020] Each recess 23a, 24a of each pair is provided on a respective plate 18 and mirror-symmetrically to the other recess 23b, 24b of the same pair provided on the other plate 18.

[0021] The two pairs of recesses 23 and 24 are provided with respect to each other at different heights, forming guides for the resting portions 25 of the respective supporting beams 16 to be installed at different heights from the ground.

[0022] The bottom 26 of each recess 23a, 23b, 24a, 24b forms at least part of the supporting surface of the resting portion 25 of the corresponding supporting beam 16.

[0023] In particular, the supporting surface of the resting portion 25 of a supporting beam 16 is formed by the bottom 26 of the respective recess 23a, 23b, 24a, 24b of each plate 18 and by the lateral edge 27 of a respective plate-like element 28, which is integrally laterally adjacent to the plate 18 so that the lateral edge 27 is substantially at the same height as the bottom 26 of the respective recess 23a, 23b, 24a, 24b.

[0024] A single plate-like element 28 is associated with each plate 18.

[0025] Advantageously, the plate-like element 28 is substantially L-shaped, as shown in Figure 2, in which it is shown in broken lines (since otherwise it would not be visible in the front view because it is hidden by the plate 18), forming, with two portions of its lateral edge 27, a part of the supporting surface for the resting portions 25 of two supporting beams 16 to be arranged at different heights.

[0026] The resting portion 25 of each supporting beam 16 is constituted by a flat element 29 at the end of said beam, which has laterally protruding parts.

[0027] The supporting head 15 is provided with safety abutment elements 30 for the end of the supporting beam 16 during the setup and removal of the supporting beam 16, which comprise hook-like portions 31 that extend, as a continuation of the upper portions of the recesses 23a, 23b, 24a, 24b, toward the outer and upper region of the plates 18.

[0028] The concavity of the hook-like portions 31 is oriented substantially toward the post 11.

[0029] They prevent the supporting beam 16, once uncoupled from one of the two heads that support it at its opposite ends, from disengaging accidentally from the remaining one.

[0030] In particular, it is the flat element 29 that forms the respective resting portion 25 that, for the laterally protruding parts, engages the hook-like portions 31.

[0031] The supporting head 15 further has two transverse elements 32 for connecting the two plates 18, on opposite sides of the post 11, which are adapted for the temporary resting of an inclined lower portion 33 of the supporting beams 16 during their setup and removal.

[0032] The transverse elements 32 substantially consist of cylindrical pivots welded at the ends to the two plates 18, conveniently at different heights.

[0033] The above cited reversible locking means 22 are of a known type and, as can be seen in Figure 4, comprise a frame 34 that is provided centrally with a through cavity that is shaped substantially in two separate portions: a first portion (not visible), which is substantially equal to the length of the initial portion 11a of the post 11, and a second portion 35, which is larger than the plan dimensions of the cross-section of the initial portion 11a.

[0034] In this portion the post 11 has, on opposite sides, two wings 36 (shown in Figure 1 and in Figure 2), on the upper ends of which the first portion of the frame 34 rests slidingly.

[0035] The base plate 17 of the supporting head 15 rests on the frame 34; in this manner, said head is supported by the frame 34, which prevents its fall.

[0036] During removal, by pushing the frame 34 toward the post 11, said frame can slide on the upper ends of the two wings 36 until the second portion 35 arrives thereat: the second portion 35 is wider than the post 11 with the wings 36 and therefore, since it cannot be supported by the wings 36, the frame 34 falls downward to the bracket 13, together with the supporting head 15.

[0037] In the use of the device according to the invention, two contiguous supporting beams 16 can be associated with a supporting head 15, as shown in the example of Figure 5, at different heights from the ground, as a function of the height of the pairs of recesses 23 and 24.

[0038] It is possible to arrange, above these supporting beams 16, formwork panels 38a, 38b, 38c, 38d of different thickness, such as to form together a formwork surface that lies on a perfect horizontal plane in order to form the floor slab.

[0039] Figures 6 to 8 show examples of use of the device 10 after the application of the formwork panels 38a, 38b, 38c, 38d.

[0040] In particular, the example of Figure 6 shows formwork provided by applying a prefabricated metallic panel 38a to the highest supporting beam 16 and a metallic panel with a wooden surface 38b, thicker than the preceding one, to the lowest supporting beam 16.

[0041] Figure 7 shows formwork provided by applying a prefabricated metallic panel 38a to the highest supporting beam 16 and a wooden panel 38c, thicker than the preceding one, to the lowest supporting beam 16.

[0042] Finally, Figure 8 shows formwork provided by applying a wood panel 38d, of the same type as the above cited wood panel 38c but thinner, to the highest supporting beam 16 and a metallic panel with a wooden surface 38b, which is thicker than the preceding one, on the lowest supporting beam 16.

[0043] It is therefore evident that the installation of the two supporting beams 16 at different heights allows to compensate for the difference in thickness of the panels used during the production of formwork for floor slabs, in order to obtain a formwork surface that lies on a perfect horizontal plane on which the concrete slab 39 is to be provided.

[0044] In practice it has been found that the invention achieves the intended aim and objects.

[0045] The device according to the invention in fact allows to use formwork panels of different thickness during the building of a single floor slab despite being at the same time structurally simple and resistant to loads.

[0046] The device is also easy to use and can be manufactured with known systems and technologies.

[0047] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

[0048] In practice, the materials used, so long as they are compatible with the specific use, as well as the contingent shapes and dimensions, may be any according to the requirements and the state of the art.

[0049] The disclosures in Italian Patent Application no. 102015000029554 (UB2015A001788), from which this application claims priority, are incorporated herein by reference.

[0050] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A supporting device, of the falling head type, for supporting beams of formwork for floor slabs, comprising a post (11), to be fixed to the end of a supporting prop rested on the ground, and a supporting head (15), coupled to said post (11), for at least one supporting beam (16) of formwork for floor slabs, said supporting head (15) comprising in turn:

   - two plates (18) arranged mirror-symmetrically, adjacent to opposite sides of said post (11), and adapted to delimit laterally two accommodation regions (19) of the ends of two supporting beams (16),
   - at least two pairs of recesses (23, 24), each one for guiding insertion and containment for a resting portion (25) of the corresponding supporting beam (16), formed by opposite parts of said post (11), each recess (23a, 24a) of each pair being formed on a respective one of said plates (18) and mirror-symmetrically to the other recess (23b, 24b) of the same pair, the bottom of each recess (23a, 23b, 24a, 24b) forming at least part of the supporting surface of said resting portion (25) of the corresponding supporting beam (16),

   said device (10) being **characterized in that** said at least two pairs of recesses (23, 24) are provided, with respect to each other, at different heights, forming guides for the resting portions (25) of the respective supporting beams (16) to be installed at different heights from the ground.

2. The device according to claim 1, **characterized in that** said supporting surface of the resting portion (25) of the supporting beam (16) is formed by the bottom (26) of the recess (23a, 23b, 24a, 24b) of each one of said plates (18) and by the lateral edge (27) of a respective plate-like element (28), integrally arranged laterally adjacent to said plate (18) so that said lateral edge (27) is substantially at the same height as said bottom (26) of the respective recess (23a, 23b, 24a, 24b).

3. The device according to claim 2, **characterized in that** said plate-like element (28) is substantially L-shaped, forming with two portions of its lateral edge (27) a part of the supporting surfaces for the resting portions (25) of two supporting beams (16) to be arranged at different heights.

4. The device according to one or more of the preceding claims, **characterized in that** said supporting head (15) is provided with safety abutment elements (30) for the end of the supporting beam (16) during the setup and removal of said supporting beam (16), which comprise hook-like portions (31) that extend, as a continuation of the upper portions of the recesses (23a, 23b, 24a, 24b), toward the outer and upper region of the plates (18).

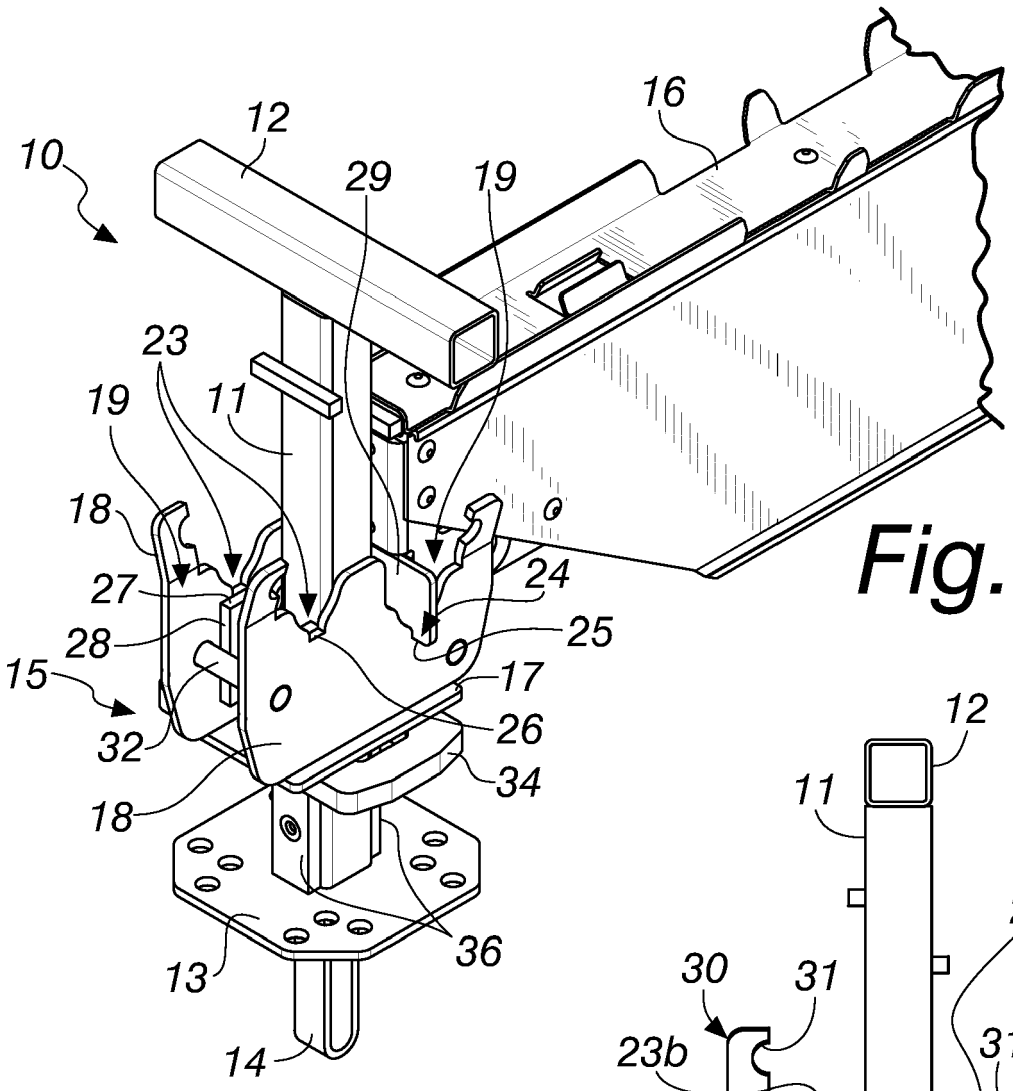
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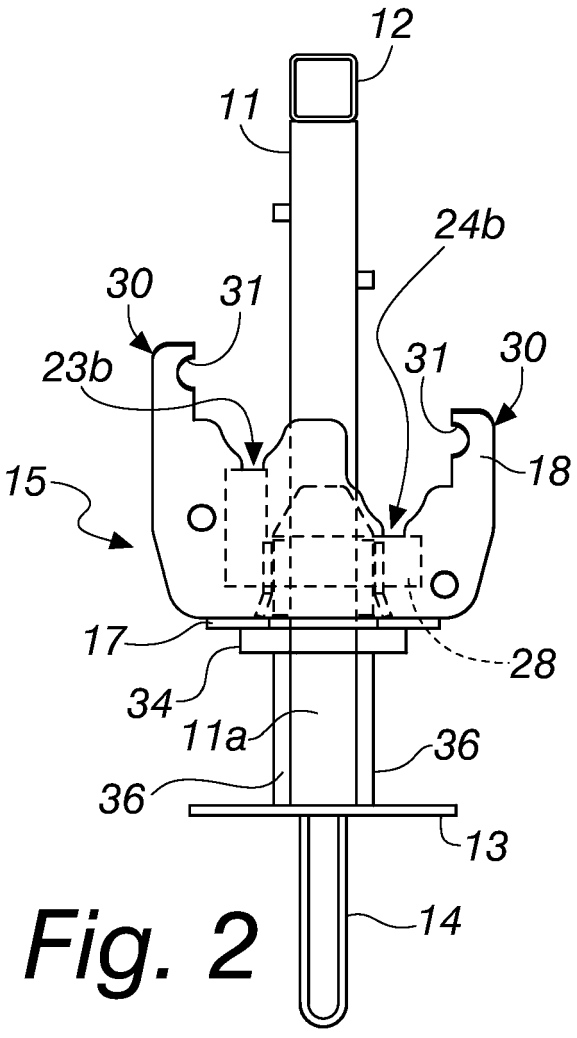
Fig. 1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24b
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23b
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11a
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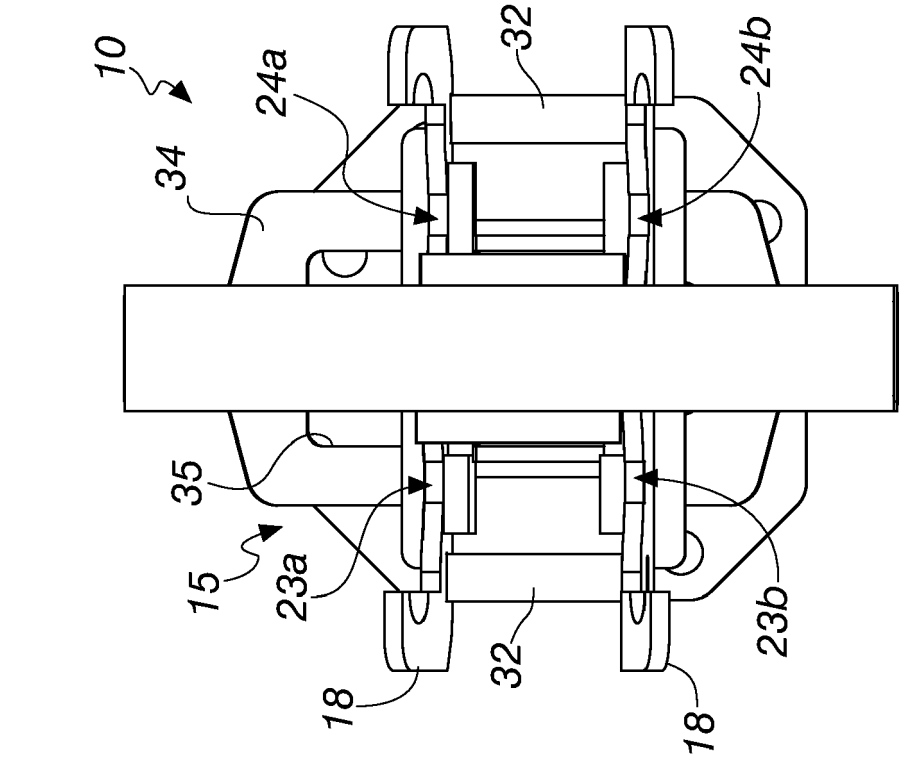
Fig. 2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24b
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23b
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Fig. 4

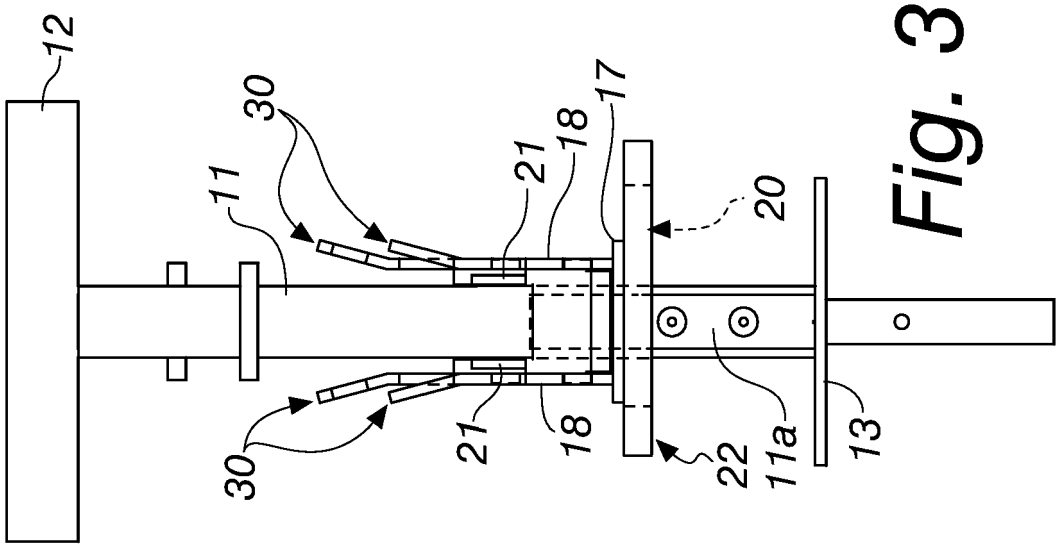
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Fig. 3

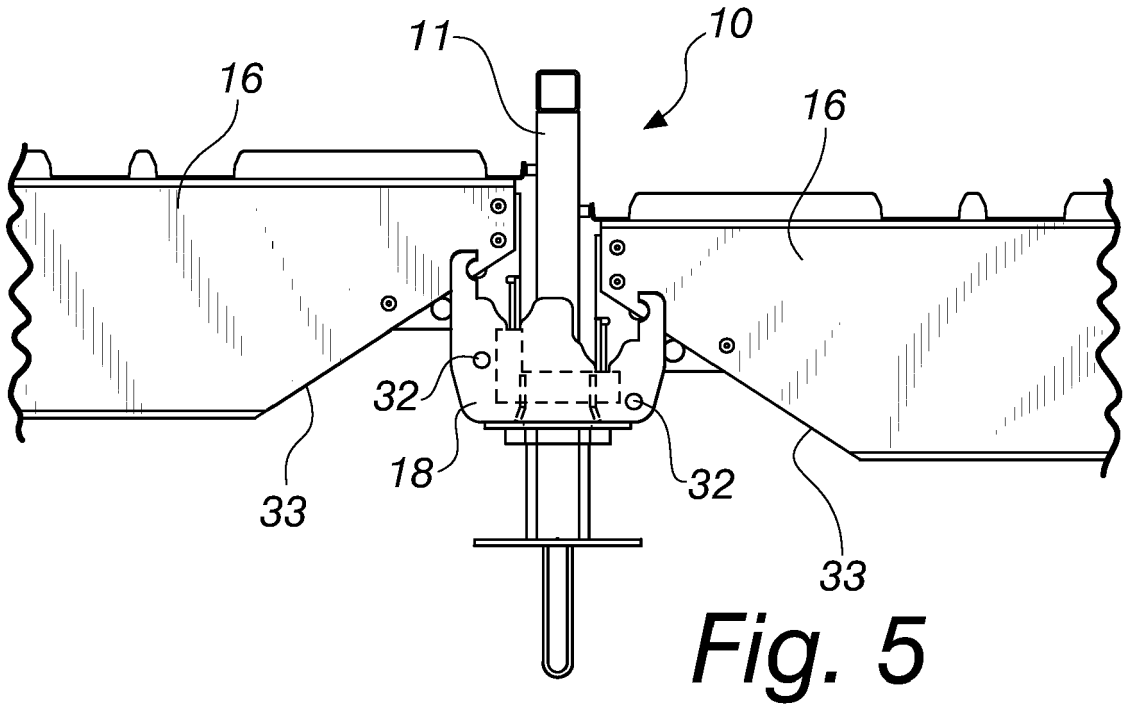

Fig. 5

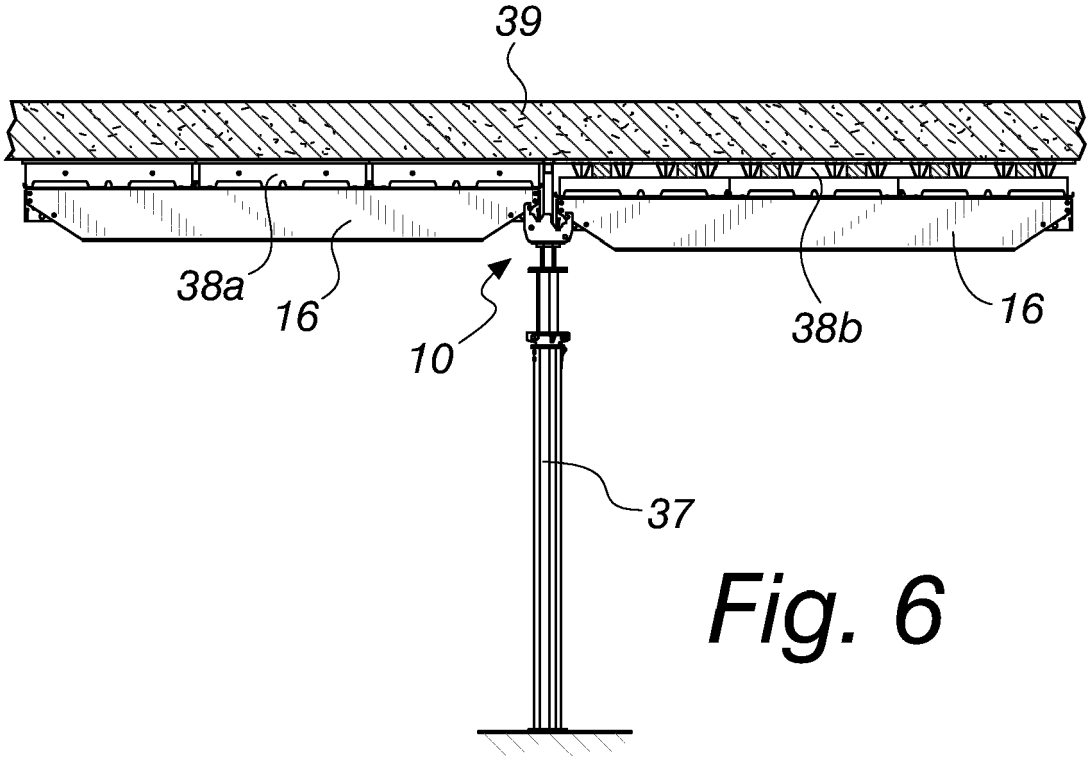

Fig. 6

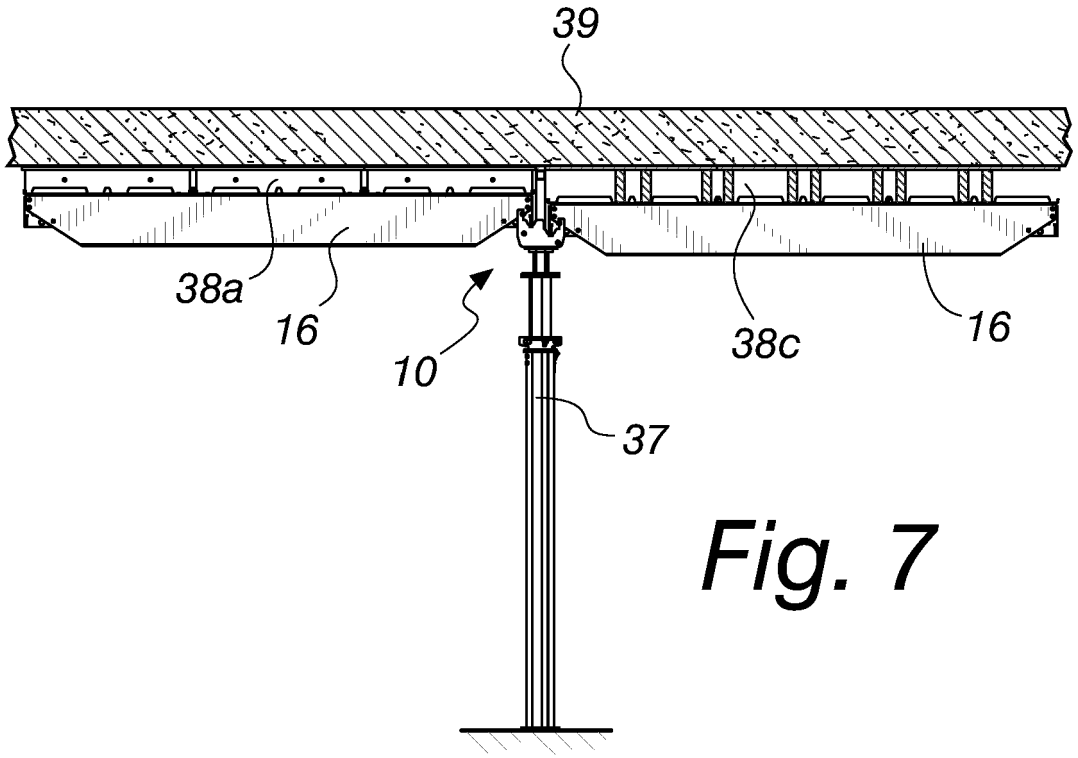

Fig. 7

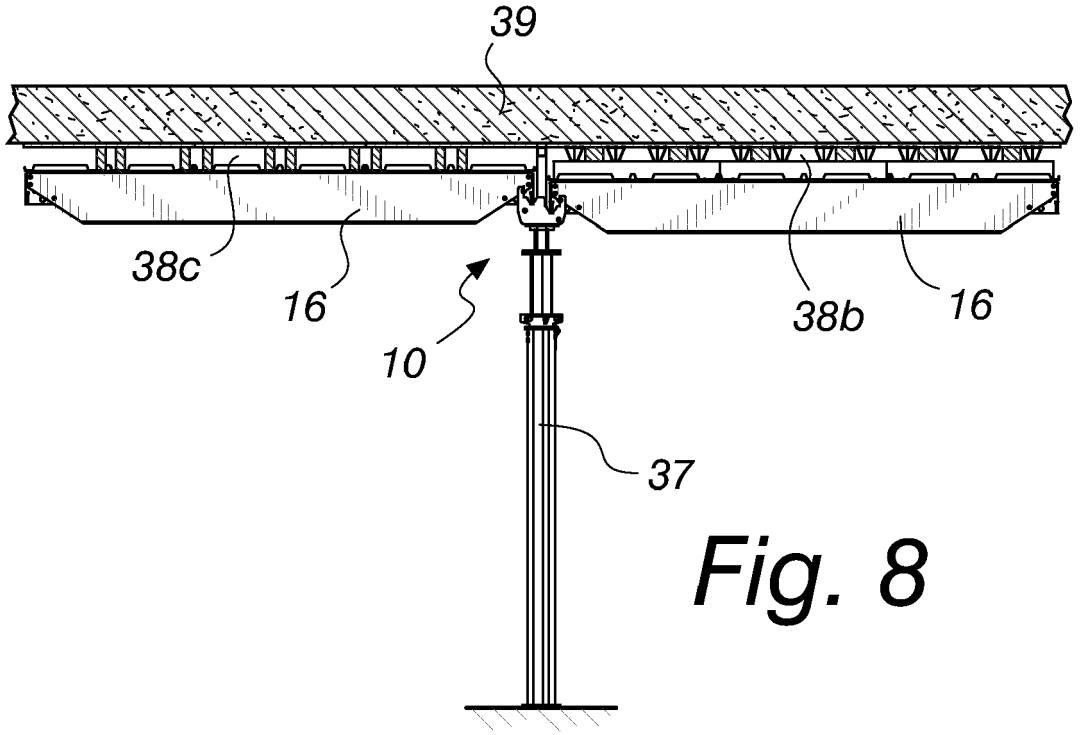

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 16 17 7297

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2006/100694 A1 (FARESIN BUILDING DIVISION S P [IT]; FARESIN GUIDO [IT]) 28 September 2006 (2006-09-28) * figure 1 *	1-4	INV. E04G11/48 E04G11/50
A	JP S60 88760 A (ARUINKO KK; ESU JII BII OOBAASHIIZU EICHI) 18 May 1985 (1985-05-18) * figure 6 *	1,4	
A	JP H10 61178 A (KURETETSUKU KK) 3 March 1998 (1998-03-03) * figure 6 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 September 2016	Tryfonas, N

CATEGORY OF CITED DOCUMENTS

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16-09-2016

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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REFERENCES CITED IN THE DESCRIPTION

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- IT 102015000029554 **[0049]**
- IT UB2015001788 A **[0049]**