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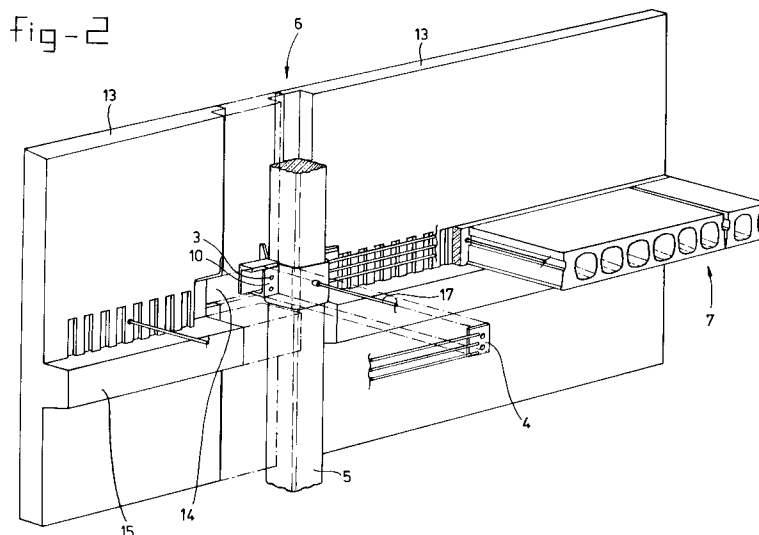
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NL-2502 LS Den Haag (NL)(54) **Supporting column, and panel for use in conjunction with said supporting column.**

(57) Supporting column (5) on which an facade (6) is suspended, for the bearing of said facade (6) and storey floors (7). Fixing means are present near the storey floors (7), for connecting the supporting column (5) to the facade (6) or storey floors (7). The supporting column (5) is in the form of a box section and is fixed to the concrete construction by means

of the sleeve which is fixed to the box section and at least partially accommodates the box section. This sleeve is provided with fixing projections which achieve the connection to the various concrete elements. An facade panel (13) adapted in particular thereto is provided with a recess (14) for connecting to the sleeve.

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The invention relates to a supporting column to which a concrete facade panel is connected, and which bears said facade panel with the storey floors, and near said storey floors is provided with fixing means for the connection between said supporting column and the concrete construction.

Such a supporting column is generally known in the prior art. Two types of facade panels are used for the production of these prefabricated concrete facade panel constructions. A first type is provided with relatively small openings for windows and the like, which openings in any case do not extend over the full length of the facade panel. The facade panel can consequently be made self-supporting and also take the weight of the storey floors. No supporting column is necessary in the case of such constructions. However, as soon as openings extend in the facade panel over such a length thereof that said facade panel is no longer capable of transmitting the vertical load from one storey to the next storey or the ground, it is necessary to place supporting columns. In the prior art all kinds of constructions for supporting columns are known, and in general they involve the use of an I-section or the like, on which the facade panel is suspended and under the floor elements is provided with projections (for example by welding), for fixing to the concrete construction. For finishing, the space between the flanges and the body of the I-section is often filled up. Since the projections fixed to the I-section have to take great forces, the fixing to the I-section must also meet high standards. In other words, relatively thick-walled material has to be used, which considerably increases the costs of such a construction. The presence of the fixing means under the floor, and in particular in the case of storey floors in the ceiling produces an unattractive overall appearance, and special measures have to be taken to conceal said fixing constructions.

The object of the present invention is to provide a construction with supporting column which is cheaper to produce, and in which the disadvantages of the unattractive appearance are largely eliminated.

This object is achieved in the case of a supporting column of the type described above through the fact that the column is a box section, and the fixing means comprise a sleeve which at least partially accommodates the circumference of the box section, the sleeve being provided with fixing projections and the wall thickness of the sleeve being greater than that of the box section. The invention is based on the idea that the forces to be borne by the supporting column make it unnecessary to use a thick-walled material for it. A thick-walled material is required only for achieving the welded connection near the corners of the box

section to fixing projections. Since these fixing projections according to the invention are now fixed to the sleeve with greater wall thickness, and the sleeve extends over at least a large part of the circumference of the box section and has to be fixed thereto, a decreased wall thickness will suffice. This can greatly reduce the cost. It is also possible with this construction to fit the sleeve within the thickness of the storey floor. This means that after the construction has been produced the fixing between box section and facade panels or floor elements is no longer visible. The appearance of the box section already meets all requirements, so that externally no further finishing is necessary. Through the use of such supporting columns, it is possible to work very accurately, i.e. once all measurements have been marked out it is not necessary to check the entire measurements again for each storey floor. It is possible with the construction according to the invention to use various constructions by making simple adjustments to the sleeve.

The fixing projections can comprise all kinds of parts for fixing not only to the facade panel and the floor slabs, but also to a tie rod fitted around the floor slabs. Supports provided with a horizontal surface can be fitted for the facade panels. Vertically extending lips can also be present, with an inlet opening at the top side bounded between said lips and the sleeve or the box section, the distance between the lips and the sleeve decreasing from the opening downwards. A metal plate, possibly having a mating lip, which in particular is fitted in a recess of the facade panel, can be introduced into such an opening. In this way facade panel and supporting column are centred and tightened relative to each other.

In order to strengthen the box section further and in particular to provide the necessary fire safety, according to a preferred embodiment it is provided with a reinforcement and filled with mortar. Of course, the filling with mortar in any case does not take place until after the placing of the supporting column. Since the construction of the sleeve is surrounded within the thickness of the floor, or has mortar poured around it, it is also provided with the necessary fire safety. In order to avoid direct contact between the sleeve or box section and the facade panel, an elastically yielding band is provided between them. Given the thin-walled construction of the box section, it is possible to make it of cold-rolled steel material.

The invention also relates to a facade panel which is adapted in particular to the above-described supporting column. More particularly, said facade panel has, in addition to at least one boundary edge, a recess for connection to the sleeve. The facade panel can also be provided near said

recess with a bearing edge (known per se) for storey floor elements.

The invention is explained in greater detail below with reference to an example of an embodiment shown in the drawing, in which:

Fig. 1 shows in perspective view a sleeve according to the invention;

Fig. 2 shows in elevation from the inside, in perspective and partially cut away, a concrete construction with supporting column and sleeve according to the present invention;

Fig. 3 shows the construction according to Fig. 2, viewed from the outside and partially cut away;

Fig. 4 shows a detail of the connection between sleeve/column and facade panel; and

Fig. 5 shows the connection of two supporting columns according to the invention, in perspective view.

In Fig. 1 the sleeve according to the invention is shown in its entirety by 1. Said sleeve comprises a bush 2. Bush 2 consists of a thick-walled steel material. Vertical lips 9 are fixed thereto, in addition to horizontal supports 8 and sockets 10 (see Fig. 2). Sockets 10 are provided with openings 3. Fig. 2 shows the sleeve fixed to a column 5. Column 5 is a thin-walled box section. The fixing is by welding. Due to the relatively large surface area, there is a large area between which the welded connection between column 5 and sleeve 1 can be carried out. It is not necessary here to make a welded joint only at the position of the supports 8 or lips 9 or sockets 10, as was necessary in the prior art, but the fixing can be carried out along a greater part of the periphery. This means that a thin-walled box section 5 is sufficient. Fig. 2 also shows an facade panel 6, comprising facade panels 13, each provided with a bearing edge 15. A number of floor elements 7 are also shown. Facade panels 13 are provided with recesses 14 which have to be placed on supports 8. Sockets 10 are suitable for accommodating a tie belt anchor 4 (only partially shown), which extends around the entire construction, in order to strengthen it further. A further reinforcement bar 17 extends from the sleeve and is accommodated in the floor construction which is subsequently filled up. Fig. 3 shows the construction according to Fig. 2 from the outside. It can also be seen from it that a layer of yielding plastic material 12 is provided between the sleeve/supporting column and the facade panel. A glassfibre-reinforced bitumen fabric 18 is placed over the entire construction, so that a closed construction is provided. Moreover, in order to provide inner finish, such facade panels are generally finished with further constructions placed in front of them. A detail of the lips 9 in engagement with facade panel 13 is shown in Fig. 4. It can be seen from this figure that

a steel plate 16 with a mating lip 20 is poured into facade panel 13. Said steel plate 16 moves with the mating lip during fitting into the opening bounded between the lips 9 and the supporting column 5.

Although the supporting column according to the invention can be of any length, according to a preferred embodiment it is designed for several storey floors. If a building is higher, it is necessary to extend such a supporting column. This can be carried out by the construction shown in Fig. 5. In this case an attachment 20 is fitted in the box section, sliding into the box section lying above it. A continuous unit can be obtained by placing the various supporting columns 5 on top of each other. The sleeve may be welded at the underside to the bottom supporting column if necessary.

After the placing of the supporting column(s), a reinforcement is fitted. This reinforcement may be fitted beforehand if desired. In any case mortar is poured into the box sections after the positioning of the box sections, in order to give them the necessary fireproofing and further rigidity.

In the case of the construction according to the present invention the connection between the supporting column and the facade panels or floor elements is made by means of constructional parts whose position can be determined very accurately. It is consequently not necessary to determine all measurements completely accurately for each storey floor. A great saving of time can be achieved in this way. The sleeve can be connected to the box section in the workshop, so that welding can be obtained in optimum conditions. This means that the weld can be of optimum strength.

The use of a separate sleeve also means that it is possible to make it of a higher grade steel than the box section and to mass-produce it.

For erecting a concrete construction and the supporting column according to the invention it is possible in a simple way according to the invention, after the box sections are placed on the ground, to fit the various facade panels and floor elements. In this case a number of storeys can be constructed/assembled at high speed.

Although the invention is explained above with reference to a preferred embodiment, it must be understood that numerous modifications can be made thereto without going beyond the scope of the present application, as described in the appended claims. For example, the box section can comprise any polygon, or can even be round in cross-section.

Claims

1. Supporting column to which a concrete facade panel is connected, and which bears said fa-

cade panel with the storey floors, and near said storey floors is provided with fixing means for the connection between said supporting column and the concrete construction, characterised in that the supporting column is a box section, and the fixing means comprise a sleeve (1) which at least partially accommodates the circumference of the box section, the sleeve being provided with fixing projections (8, 9), and the wall thickness of the sleeve being greater than that of the box section.

2. Supporting column according to Claim 1, in which the sleeve is fitted in the thickness of the storey floor. 15
3. Supporting column according to one of the preceding claims, in which the fixing projections comprise supports (8) provided with a horizontal surface for supporting the facade panel. 20
4. Supporting column according to one of the preceding claims, in which the fixing projections comprise sockets (10) for a tie belt anchor (4). 25
5. Supporting column according to one of the preceding claims, in which the fixing projections comprise vertically extending lips (9) with an inlet opening (11) at the top side bounded between said lips and the sleeve/the box section, the distance between the lips and the sleeve /the box section decreasing from the opening downwards. 30 35
6. Supporting column according to one of the preceding claims, in which the box section is provided with reinforcement on the inside and is filled with mortar. 40
7. Supporting column according to one of the preceding claims, in which an elastically yielding band (12) is fitted at least between the sleeve/the box section and the facade panel. 45
8. Supporting column according to one of the preceding claims, in which the box section comprises a cold-rolled steel material. 50
9. Facade panel for use in conjunction with the supporting column according to one of the preceding claims, comprising in addition to at least one boundary edge a recess (14) for connection to the sleeve. 55

10. Facade panel according to Claim 9, provided near said recess with a bearing edge (15) for storey floor elements.

11. Facade panel according to Claim 9 or 10, in which a metal plate (16) is provided in the recess (14), for engagement between the lips and the sleeve.

12. Facade panel according to Claim 11, in which plate (16) is provided with mating lip (20).

fig-1

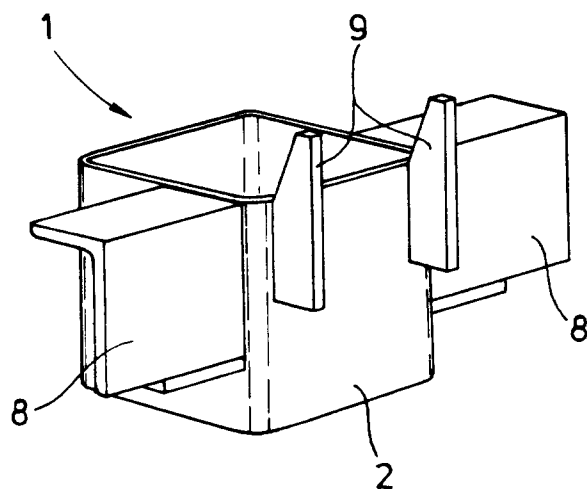
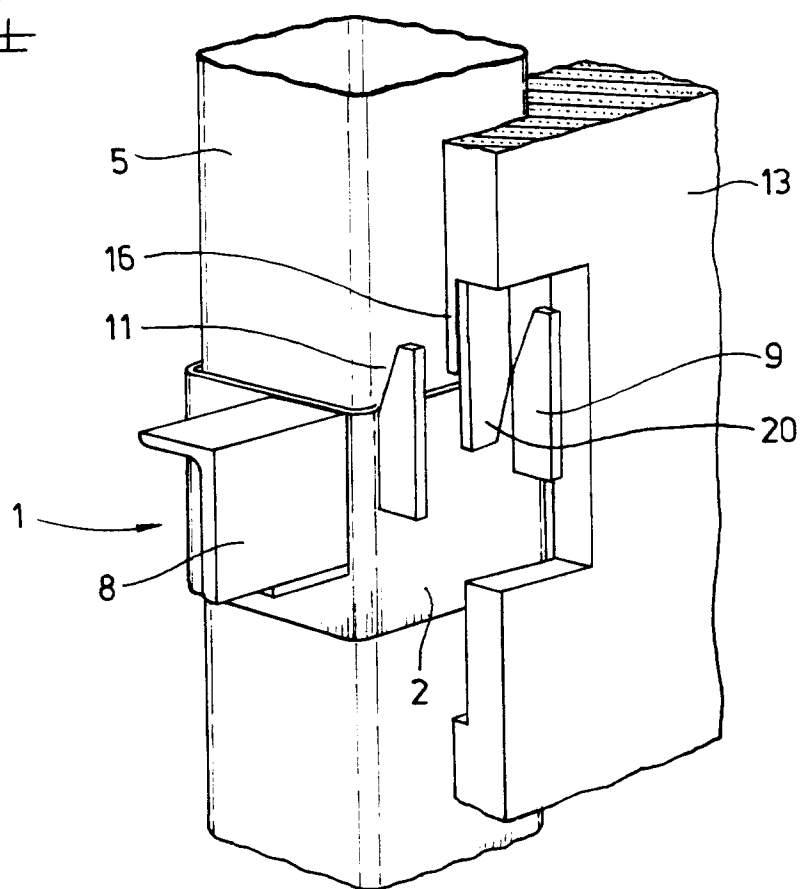
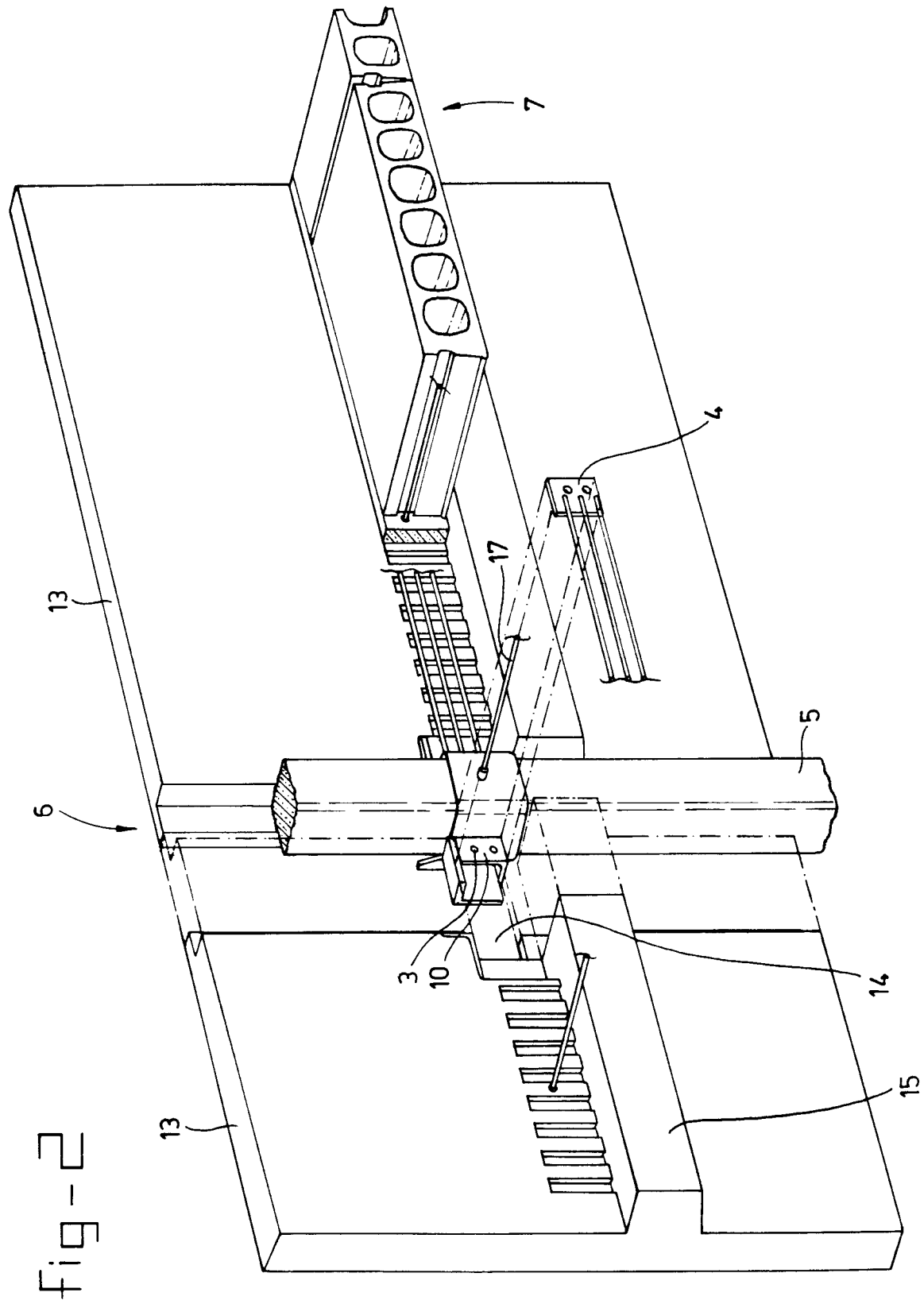


fig-4





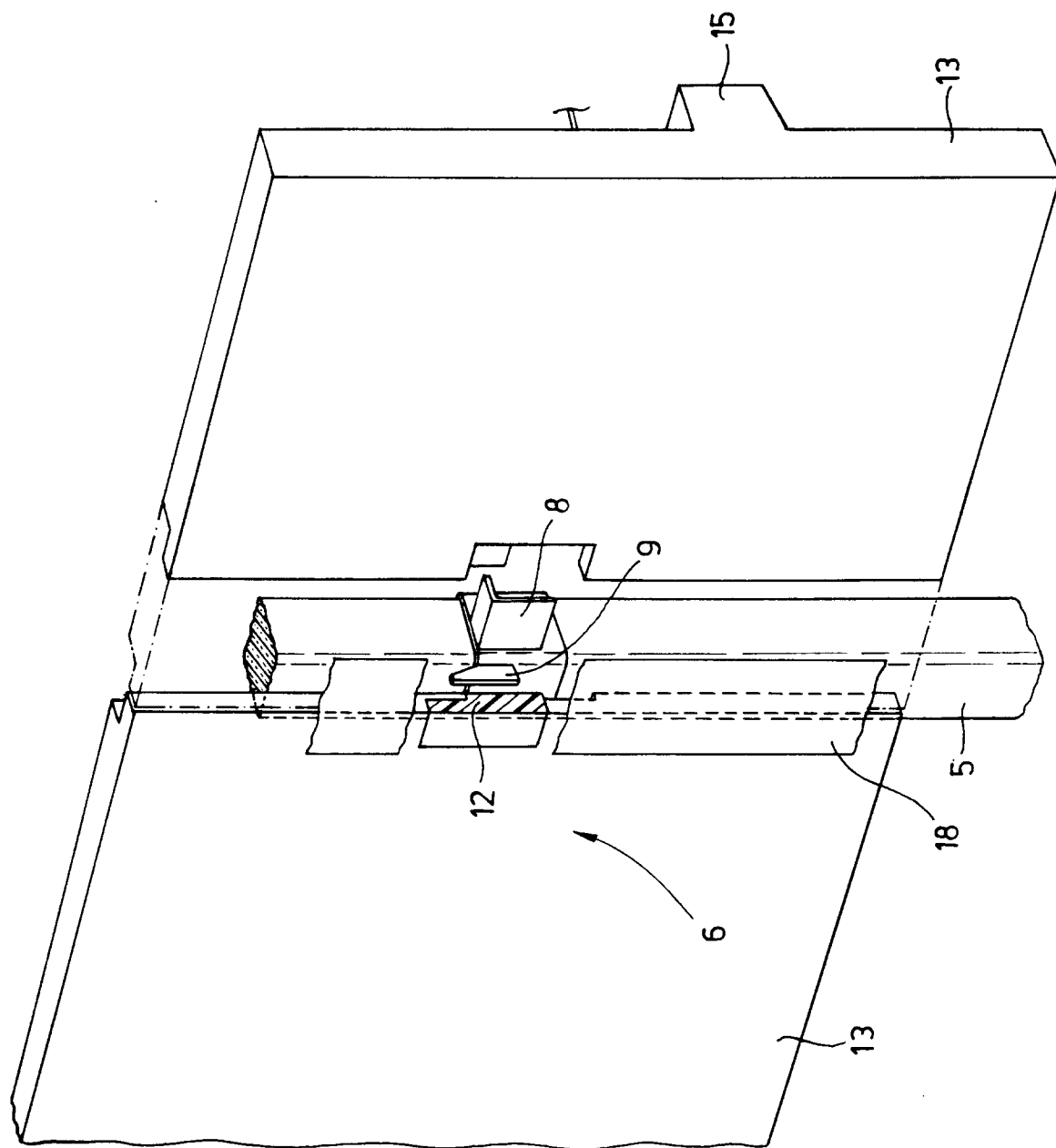
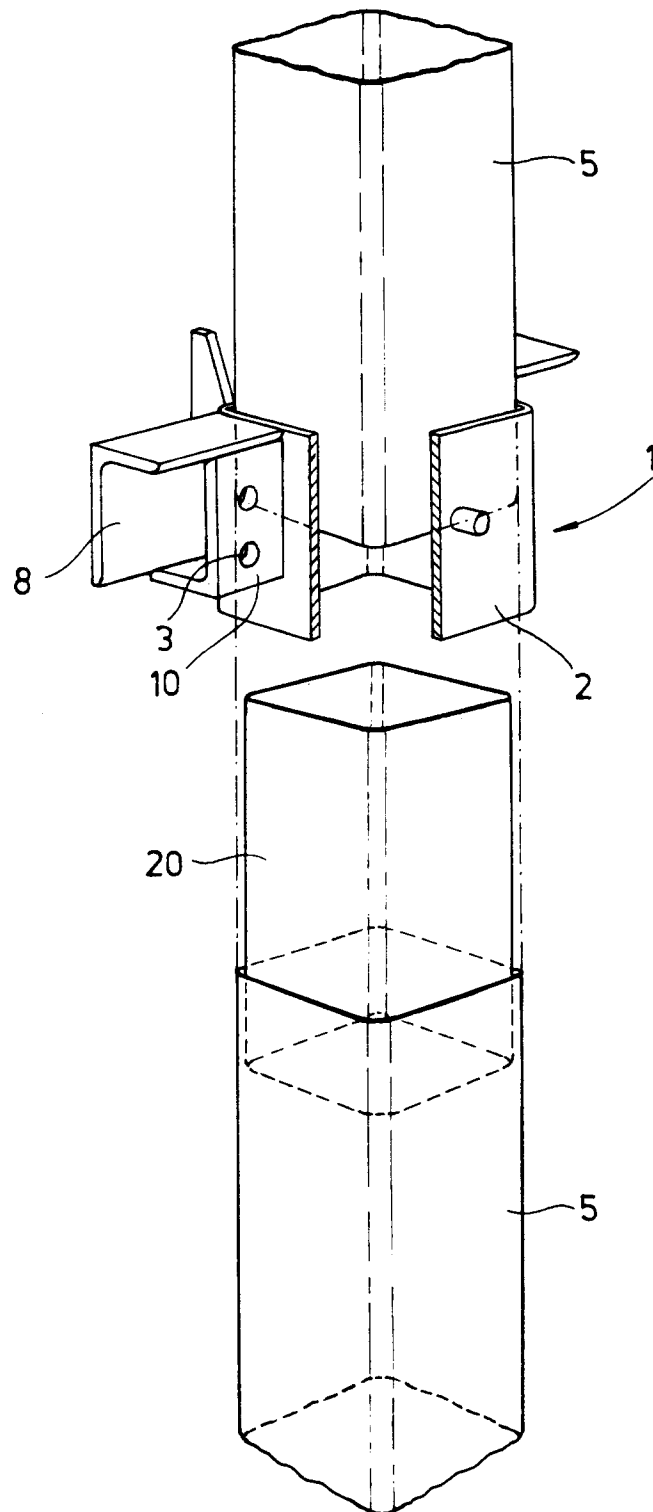


fig-3

fig - 5





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EUROPEAN SEARCH REPORT

Application Number

EP 93 20 1602

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	FR-A-2 226 516 (CANAVESE) * page 1, line 22 - page 2, line 39 * * page 4, line 30 - page 5, line 7 * * page 7, line 7 - line 33; figures 1,9-11 * ---	1-3	E04B1/24 E04B2/94
A	DE-A-3 306 890 (MENERINGHAUSEN) * page 4, line 1 - page 5, line 18 * * page 13, line 12 - line 19; figure 7 * ---	1,3,8	
A	FR-A-2 109 212 (CASTELLI) * page 1, line 18 - line 26 * * page 2, line 2 - line 20; figures 1,3-5 * ---	1,9	
A	DE-A-4 021 534 (BONINK) * column 2, line 45 - column 3, line 32 * * column 3, line 59 - column 4, line 58 * * column 5, line 26 - line 39; figures 1,2,5-12,19 * ---	1,9	
A	BOUW vol. 29, no. 35, 31 August 1974, ROTTERDAM NL pages 767 - 773 'kantoorgebouw ods in rotterdam' * page 771; figure 20.21 * ---	6	TECHNICAL FIELDS SEARCHED (Int. Cl.5) E04B
A	DE-A-3 506 140 (UTNER) * page 6, line 3 - line 12 * * page 10, line 32 - page 12, line 19 * * page 14, line 3 - line 18 * * page 21, line 1 - line 24; figures 1-4,7,8,19,20 * ----- -----	9,11,12	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30 AUGUST 1993	Examiner HENKES R.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document			