



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
14.05.2003 Bulletin 2003/20

(51) Int Cl.7: **E04B 5/14, E04B 5/10**

(21) Application number: **01500266.0**

(22) Date of filing: **08.11.2001**

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

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(54) **A floor**

(57) This floor comprises main floor beams (2) resting on pillars (1) and having secondary floor beams (3) fitted between them. The floor is characterized in that height adjustable feet (8') are supported on and secured to the secondary floor beams (3) and support floor plates (9) being arranged in a removable assembly and forming the flooring base, and in that a barrier being formed by a metal plate (7') is directly secured below the sec-

ondary floor beams (3), plates forming a ceiling acting as an acoustic and fire barrier being secured by means of sections to said secondary floor beams (3) below said barrier (7'). Also characteristic is the fact that several of the secondary floor beams (3) are connected to each other in a parallel arrangement thus forming modules being provided to be fitted and secured between the main floor beams (2), said modules also possibly comprising other floor components.

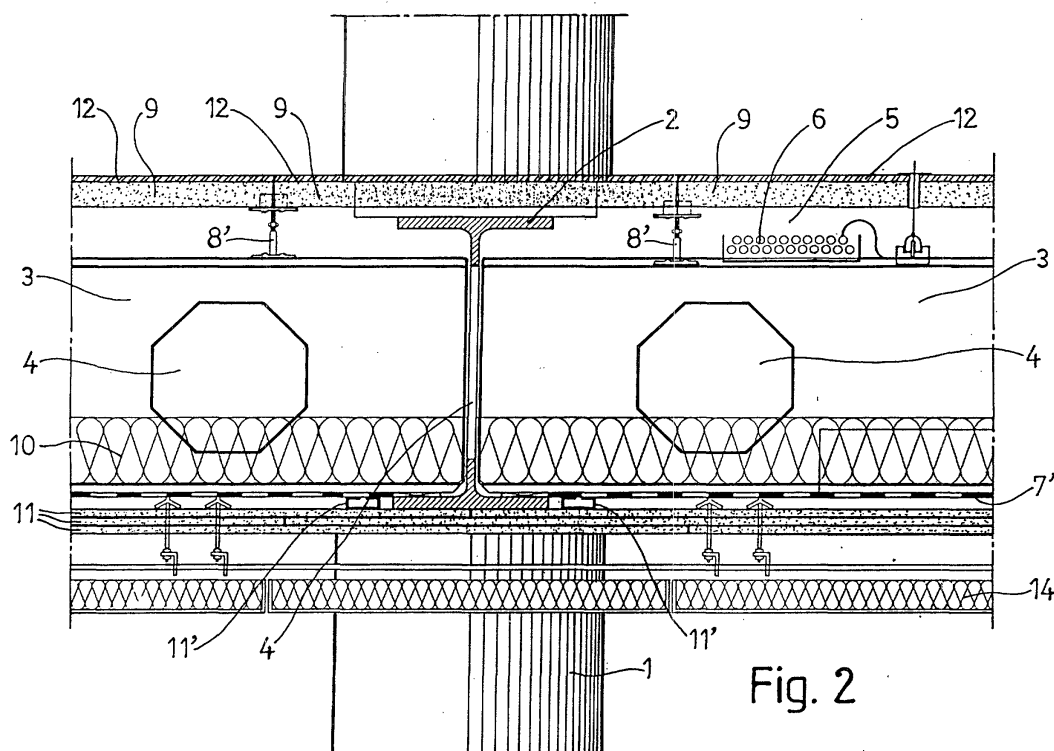


Fig. 2

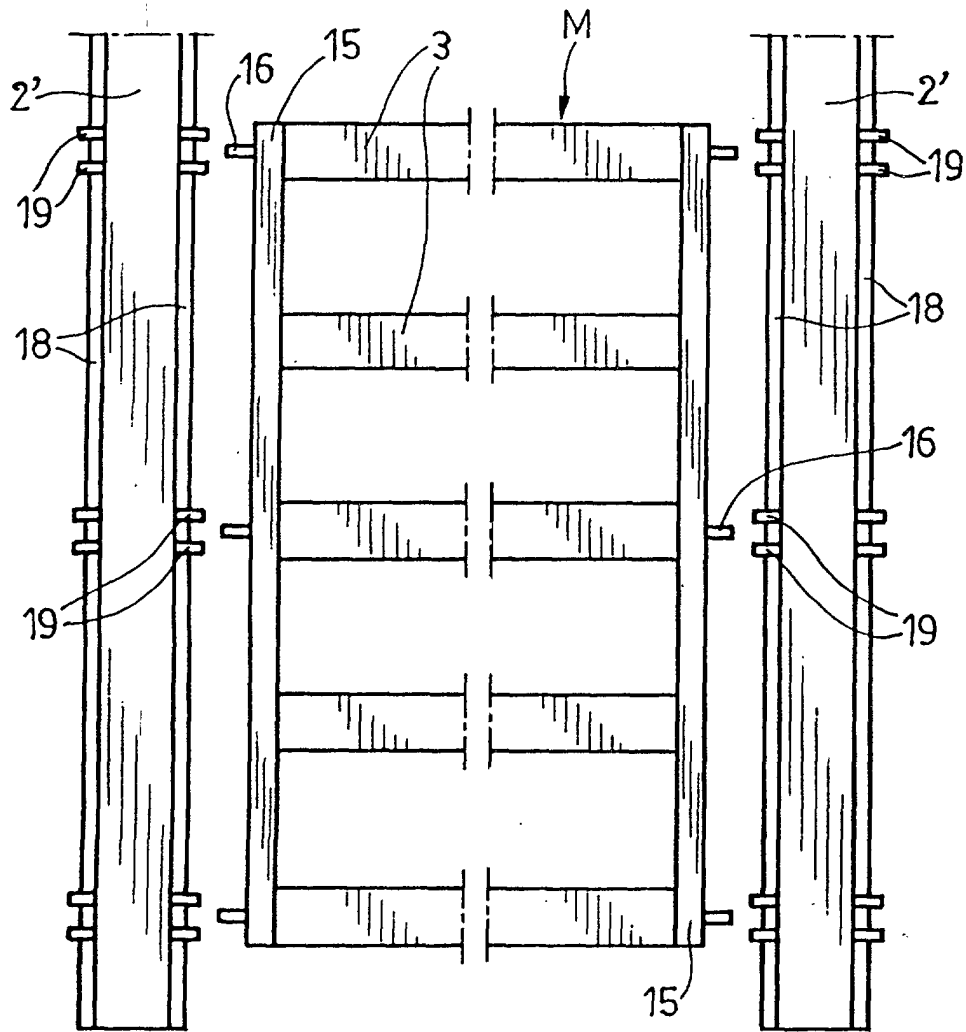


Fig. 3

Description

[0001] The present invention relates to improvements in the floors providing the separation between storeys of buildings preferably being office buildings.

[0002] As is well known, floors consist of flat and horizontal structures that are supposed to have enough bearing capacity and rigidity, said structures supporting the flooring and defining or supporting the ceiling.

[0003] Both in the case of using floor beams and joists and arranging between them a filling of concrete, jack arches or other components, and in the case of using floor plates or slabs made of reinforced concrete or comprising ceramic members, known floors require much labour and time for their construction.

[0004] Because of their substantial weight this kind of floors have to be furthermore supported with a great number of pillars and with foundations being apt to provide a firm support for the construction, all this increasing the time needed to conclude the construction and the floor price per sq. mtr.

[0005] This same applicant is the owner or the Spanish patent of invention no. 200001719 having as its object a floor notably improving the known floors since besides being safe it has a lightweight structure being apt to be quickly installed as per a "dry" assembly procedure, and also being inexpensive and having a performance offering more benefits as compared with the conventional floors.

[0006] The floor of said patent is basically characterized in that main floor beams with openings are supported on the pillars, and between them secondary floor beams are fitted which are also provided with openings and in their turn support joists transversally resting on them, floor plates forming the flooring base being arranged in a removable assembly on top of said joists, plates forming a ceiling acting as an acoustic and fire barrier being secured below said main and secondary floor beams with the intermediary of a metallic barrier.

[0007] It is the object of the present invention to improve the floor corresponding to the precited Spanish patent no. 200001719 by further reducing its height, simplifying its general structure, avoiding horizontal bracings, improving the horizontality of the flooring, and still further reducing the time being needed for the construction of the floor and hence of the building.

[0008] This new floor is characterized in that the joists have been eliminated, adjustable feet being arranged on the secondary floor beams to horizontally support the floor plates that will form the flooring base thus (by more than 20%) reducing the floor height while leaving an upper space between the secondary floor beams and the floor plates for the installation of the necessary cables and ducts making up the facilities supplying the premises in the building.

[0009] Also characteristic is the fact that the metallic barrier is secured directly below the secondary floor beams, and that the plates forming the ceiling are se-

cured by means of sections to said secondary floor beams below the metallic barrier.

[0010] The possible prefabrication of several floor components has been also foreseen mainly regarding the secondary floor beams, several of these latter for such a purpose being grouped in a parallel arrangement and being thus connected to each other thus forming modules that will be directly fitted to the main floor beams thus allowing to save a lot of time (practically half the time) in the formation of the floor and requiring less cranes, less storage and less supply means, said prefabrication approach being hence very advantageous.

[0011] These prefabricated modules made up of secondary floor beams can already comprise the attachment of the metallic barrier as well as other components such as for example trays carrying the cables and ducts making up the facilities supplying the premises.

[0012] These and other characteristics will be best made apparent by the following detailed description whose understanding will be made easier by the accompanying three sheets of drawings showing a practical embodiment cited only by way of an example not limiting the scope of the present invention.

[0013] In the drawings:

Fig. 1 shows in a sectional elevation the floor structure during the early stages of its construction,

Fig. 2 illustrates in a sectional elevation the floor structure in its end stage,

Fig. 3 is a plan-view showing the structure of a prefabricated module being made up of several secondary floor beams and its means being provided to attach it to the main floor beams, and

Fig. 4 is a sectional elevation showing a detail of the attachment of said modules to the main floor beams.

[0014] According to the drawings this floor is supported on pillars 1 being for example made of steel and of circular cross-section and being filled with concrete thus providing safety in case of fire, said pillars possibly being continuous heightwise thus spanning more than one storey, or discontinuous to thus allow to fit the main floor beams to them. Main floor beams 2 are supported on these pillars, said beams being made of steel and being apt to bridge long spans, secondary floor beams 3 being fitted between these main floor beams and being also made of steel and forming the framing and support for the flooring, all of these beams being provided with openings 4 for the passage of the facilities equipping the building, a top free space 5 being available for the passage of the cables and ducts 6 belonging to the systems comprised by said facilities (Fig. 2).

[0015] Below the secondary floor beams 3 a metallic barrier 7' is directly secured and is formed by a multiapertured or nonapertured zinc-plated steel plate acting as a safety means to prevent labourers or objects from falling during the execution of the work, said steel plate

also acting as a safety barrier between storeys after the conclusion of the work.

[0016] Height adjustable feet 8' are supported on and secured to the secondary floor beams 3 and are being provided to obtain a perfect horizontality for the flooring, said feet supporting floor plates or slabs 9 being made of concrete or silicocalcareous material, being arranged in a removable assembly and forming part of the flooring. As can be seen in Fig. 1 the contiguous floor plates are initially arranged on top of a row of floor plates 9 in order to thus leave between them free spaces allowing to carry out the installation of the lighting, water, gas, telephone and air conditioning systems and of the other systems being needed to supply the premises that are being built.

[0017] A flexible layer 10 is arranged on top of the metallic barrier 7' and is made of a sound-absorbing material such as rock wool, for example.

[0018] Once having installed the skin all around the building and having rendered this latter weatherproof plates 11 will be secured by means of sections 11' below the main and secondary floor beams, said plates for example being plaster-board plates arranged in a break-joints arrangement thus forming the ceiling and acting as an acoustic and fire barrier between two storeys.

[0019] Floor tiles 12 are arranged on top of said floor plates 9, the components of the final flooring being then arranged on top of said floor tiles and for example consisting of marble or granite, parquet or moquette pieces or pieces of other materials, all of these elements being installed in a removable assembly.

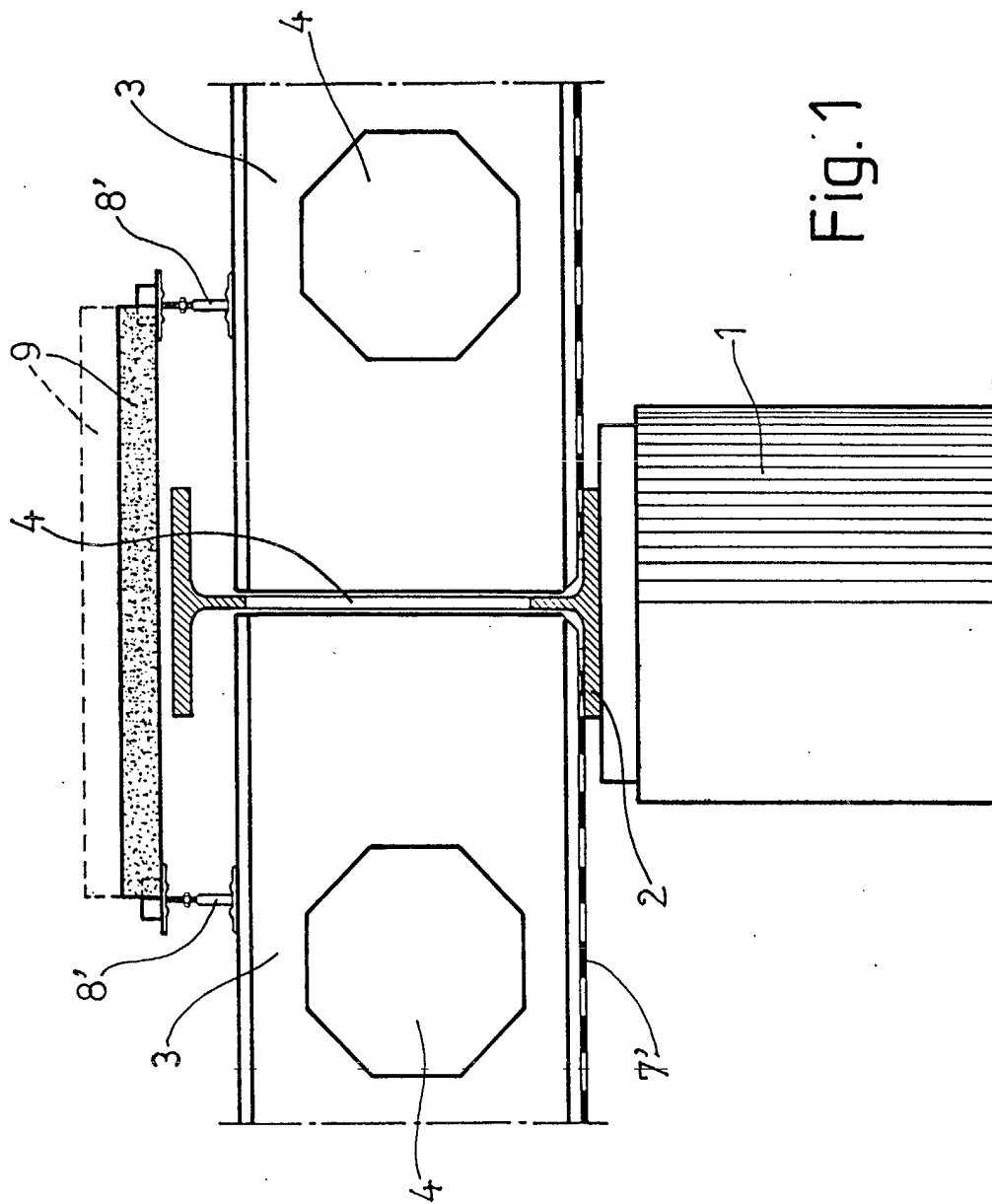
[0020] The bottom surface of plates 11 forming the ceiling will be provided with a finish being for example a paint finish, or else a complementary false ceiling 14 will be optionally installed below said plates, said false ceiling being for example formed by an apertured metal plate provided with a rock wool insulating layer, said false ceiling allowing to install recessed lighting fittings (not shown) and a complementary sound-absorption.

[0021] Other than separately manufacturing the floor components some of them or even the whole floor can also be prefabricated.

[0022] It has been foreseen to group in a parallel arrangement and to connect to each other at their ends (Fig. 3) the secondary floor beams 3 for example in a number of five and by means of a rectangular channel-section 15 being externally provided with integral vertical tabs 16 with apertures 17 thus forming a module M being provided to be vertically slid between the main floor beams 2' in order to be thus fitted to them, said main floor beams being in this case formed by rectangular, hollow sections with the corresponding openings 4 and with a base laterally projecting to form opposite horizontal tabs 18. Pairs of vertical tabs 19 with apertures 20 are welded on both lateral sides of this beam in correspondence with the tabs 16 of the module M in order to secure these latter between each pair for example by means of bolts and nuts (not shown) (Fig. 4).

Claims

1. A floor comprising main floor beams resting on pillars and having secondary floor beams zitted between them, **characterized in that** height adjustable feet are supported on and secured to the secondary floor beams and support floor plates being arranged in a removable assembly and forming the flooring base.
2. A floor as per claim 1, **characterized in that** a barrier being formed by a metal plate is directly secured below the secondary floor beams.
3. A floor as per claims 1 and 2, **characterized in that** plates forming a ceiling and acting as an acoustic and fire barrier are secured by means of sections to the secondary floor beams below the metallic barrier.
4. A floor as per claim 1, **characterized in that** several secondary floor beams are connected to each other in a parallel arrangement thus forming prefabricated modules being provided to be fitted and secured between the main floor beams.
5. A floor as per claim 4, **characterized in that** the modules having been prefabricated with the secondary floor beams comprise as well other floor components.
6. A floor as per claims 1 through 3, **characterized in that** said floor is formed by prefabricated modules comprising all its components.



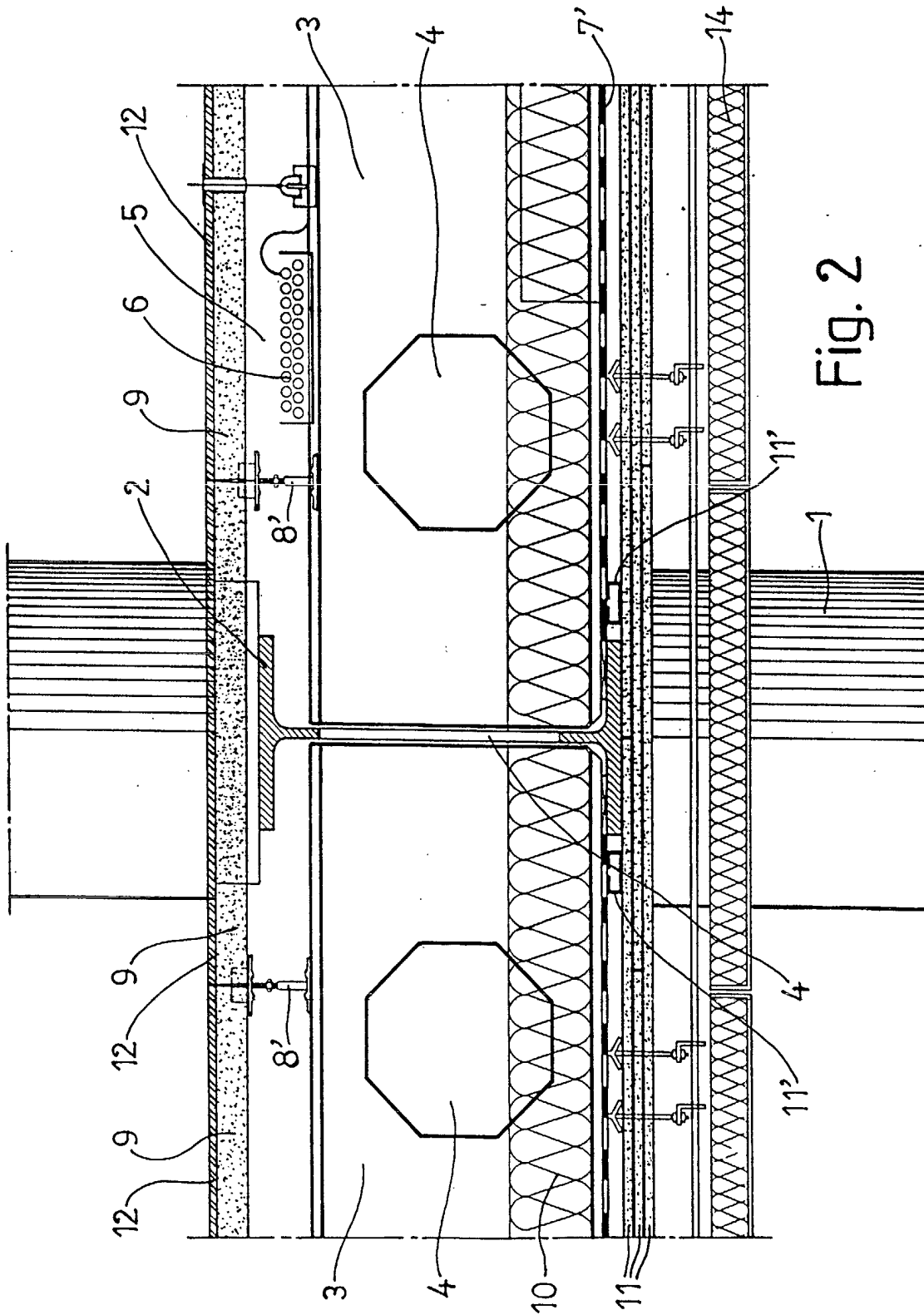


Fig. 2

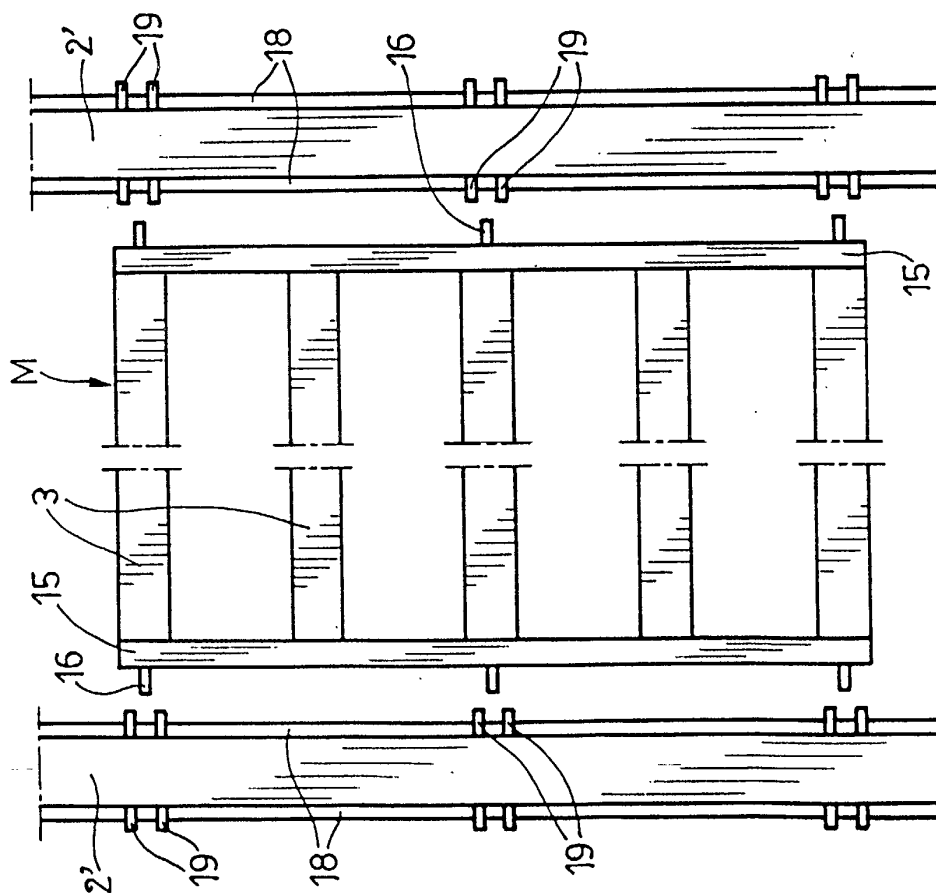


Fig. 3

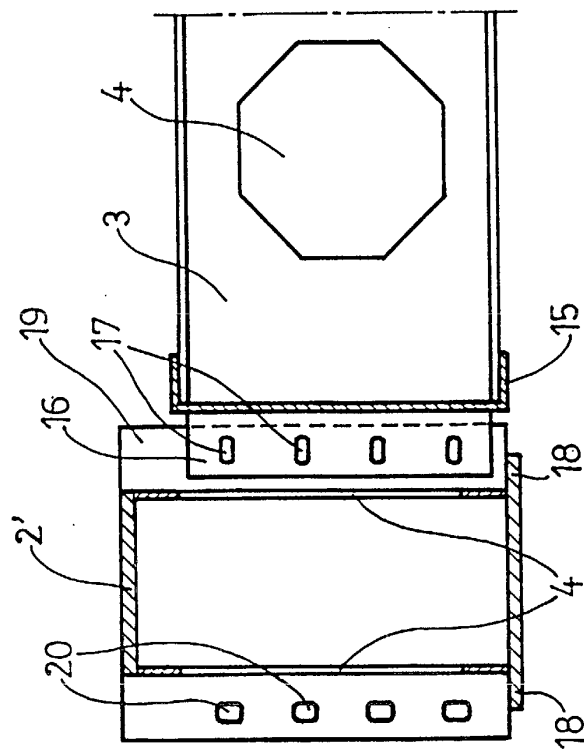


Fig. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 50 0266

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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 5 March 2002	Examiner Stern, C
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			

EPO FORM 1503 03.82 (P4/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 50 0266

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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05-03-2002

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