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(54) **Wall member**

Wandelement

Élément de mur

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Description

AREA OF INVENTION

The present invention relates to a new construction of a wall member for building of houses in one or several flats.

PRIOR ART

A wall member of the general type, which the present invention relates to, appears from e.g. Swedish Patent Specification No. 8902760-1 disclosing a wall member having essentially C-shaped cross-section, with an upper flange and a lower flange and a web extending therebetween. Pillar beams extend between the upper and lower flanges and support the load between the flanges. In such a construction, the web can be made thinner and, thus, a better insulation of the wall member can be obtained. Such insulation is placed in the free spaces between the flanges and the pillar beams.

Although the foot portion (lower beam flange) of this wall member is not necessarily foreseen with reinforcements, no hint is given that the foot portion does not sustain any essential load being transferred via the pillar beams (vertical bracing).

A similar load carrying construction appears from Swedish Patent Specification No. 8701767-9. In this specification, the pillar beams are cast in one piece with a foundation plate. A number of edge blocks are adapted along the foundation. Each edge block is provided with an outer plastered surface and the remaining portion is made of cellular plastics comprising vertical grooves in which the concrete flows at the casting of the foundation plate for forming load carrying "legs". An upper beam or flange transmits load from brick walls or similar positioned thereabove through the "legs" to the foundation plate.

Further similar constructions appear from e.g. US-A-2,202,745, DE-A1-24 22 586 and WO 84/01976.

SUMMARY OF THE INVENTION

The object of the present invention is to provide a wall member for buildings comprising an upper flange, a bottom foot portion, a depending front web extending between the upper flange and the foot portion, and several essentially vertical pillar beams extending from the upper flange to the foot portion. According to the invention, said foot portion has a smaller dimension in the transversal direction compared to said upper flange and is essentially without reinforcements whereby the load from a wall member positioned thereabove is transmitted to the flange and thence to the building member therebelow via the pillar beams without any essential loading of the foot portion and the front web. Preferably, the upper flange is provided with an upwardly and inwardly

extending support portion which forms an inside portion of the flange, and an abutment surface which forms an outside portion, whereby the abutment surface is recessed in relation to the support portion.

Moreover, there may be provided a guiding surface between said support portion and said abutment portion for cooperation with a foot portion of an upper wall member for guiding it to its correct position at the abutment surface. Said pillar beams may be chamfered at the bottom portion for decreasing the transversal dimension to essentially the same dimension as said foot portion.

In an alternative embodiment, the pillar beams extend down to the bottom level of the foot portion with the same uninterrupted cross-section for forming bottom pillar abutment surfaces for cooperation with a corresponding abutment portion of a lower wall member, which abutment portion is provided with recesses with a shape corresponding to said bottom pillar abutment surfaces for load transmitting cooperation therebetween.

SHORT DESCRIPTION OF THE DRAWINGS

The invention is described below in more details with reference to preferred embodiments shown in the appended drawings, in which:

Fig. 1 is a cross-sectional view of a first embodiment of the wall member according to the invention.

Fig. 2 is a perspective view of a part of the first embodiment of the wall member shown in Fig. 1.

Fig. 3 is a perspective view similar to Fig. 2 of a second embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

Fig. 1 shows across-section of the wall member 1 according to the invention supported by a foundation plate 2 or a foundation beam, e.g. of the type ERGE.

The wall member 1 comprises an upper flange 3, a depending front web 4 and a lower foot portion 5. The foot portion 5 stands on a support such as said foundation plate 2 usually via a sealing 6, which can be a rubber sealing, asphaltic board or plastics or other similar materials used today. The foot portion 5 only performs a sealing action against the foundation plate 2.

Several essentially vertical pillar beams 7 extend between the upper flange 3 and the foot portion 5, c.f. Fig. 2, for transmitting load from the upper flange to the support 2.

A perspective view of the wall member is shown in Fig. 2. The pillar beams 7 are positioned at suitable mutual distances in dependence of the expected load.

Between the pillar beams 7 are placed insulation materials parallel to the front web 4, in the nature of first insulation disks 8 which fill the space between the pillar beams 7 and abuts the front web 4 and extends from the upper flange 3 to the foot portion 6. Moreover, there are second cellular plastics disks 9 positioned along the

entire inside of the wall member and extending from the upper flange 3 and down to the support 2, or an inner floor, see the upper part of Fig. 1. Moreover, there are cellular plastics material for preventing cold bridges at the inside of the upper flange at 19 and at the inside of the foot portion at 20, 21 as shown in Fig. 1.

Of course other materials than cellular plastics can be used, such as mineral wool and other equivalent materials.

As appears from Fig. 1, the upper flange 3 is provided with an inwardly and upwardly extending support portion 11 for supporting an ceiling member 10 or similar. A fillet 12 is positioned between the support portion 11 and the ceiling member 10.

The outside portion of the upper flange forms an abutment portion 14 for a second wall member 1' stacked on top of the first wall member via a rubber sealing 13. The abutment portion 14 is recessed in relation to the support portion 11 as appears from Fig. 1.

The pillar beams 7 have a substantially constant cross-section along the length thereof and are chamfered at the lower portion as shown at 15, Fig. 2, for adaption to the foot portion 5.

The upper flange 11 is provided with a tensile reinforcement 16 in a conventional way. The front web 4 can be provided with a net reinforcement (not shown) for preventing formation of cracks. The foot portion 5 is essentially without any reinforcement.

The wall member according to the invention is dimensioned and calculated so that the upper flange 16 and the pillar beams 7 transmit the prevailing loads from a building member positioned thereabove (wall member 1') to a building member positioned therebelow (the foundation plate 2 or an ERGE foundation beam or another wall member 1'). The pillar beams 7 support the load. As mentioned above, the foot portion 5 is constructed only to perform a sealing action against the support and transmits no load. Also the front web 4 is unloaded and can be constructed thin in order to let place for a great amount of insulation materials 8 and 9.

The outer side of the front web 4 is surface treated directly after the casting and looks like a plastered surface which makes the outside essentially free from maintenance.

By the construction of the upper flange 3 with a upwards extending support portion 11 and an outer abutment portion 14 which is lower in relation to the support portion 11, several advantages are obtained. Possible water condensating at the upper flange 3 flows downwards towards abutment portion 14 and further outwards to the outside of the wall member.

At building of houses having several flats, several wall members are stacked upon each other without requiring use of different types of wall members. A surface connecting said support portion 11 and said abutment portion 14 forms a guide surface 22 guiding the foot portion 5 of an upper wall member 1' to its correct position at the lower wall member 1, which makes the mounting

work easier and safer.

The wall member is further provided with an inner lining 18 in the nature of plaster gypsum boards or any other conventional construction.

Fig. 3 shows a second embodiment of the wall member according to the invention. In this embodiment, the pillar beams 7 extend right down to the bottom level of the foot portion without any chamfer. Thus, the lower portion of the pillar beams form feet for cooperation with a lower building member. In this construction, the foot portion 5 of the wall member is still more unloaded. As appears from Fig. 3, the support portion 11 is provided with recesses 23 for enclosing the feet of the pillar beams of an upper wall member. Said recesses can be provided with guide surfaces parallel to guide surface 22 for guiding the feet of the pillar beams in the correct position.

It appears that the transversal dimension of the foot portion can be narrow, while the upper flange is wider, preferably double the width of the foot portion or more. The pillar beams have a width therebetween.

The wall member according to the invention can be used as a cellar wall member completely or partly positioned below the ground level, or as a wall member for flats thereabove in a house with several flats.

It is remarked that the wall members are interconnected in the side direction with conventional methods, such as grooves and pin connections etc. The same applies to the vertical stacking and connection to the ceiling members.

Hereinabove have been described several embodiments of the invention with reference to the drawings. However, a skilled person realizes further possibilities to modify the constructions for achieving the object of the invention and such for a skilled person obvious modifications are intended to be encompassed within the scope of the invention. The invention is only limited by the patent claims below.

Claims

1. Wall member (1) for buildings comprising an upper flange (3), a bottom foot portion (5), a depending essentially vertical, in use, front web (4) extending between the upper flange and the foot portion, and several essentially vertical, in use, pillar beams (7) extending from the upper flange (3) to the foot portion (5), wherein said foot portion (5) has a smaller dimension in the transversal direction compared to said upper flange (3) and is essentially without reinforcements whereby the load from a wall member (1') positioned thereabove is transmitted to the upper flange (3) and thence to the building member (2) therebelow via the pillar beams (7) without any essential loading of the foot portion (5) and the front web (4).

2. Wall member according to claim 1, **characterized** in that the upper flange (3) is provided with an upwardly and inwardly extending support portion (11) which forms an inside portion of the flange, and an abutment surface (14) which forms an outside portion, whereby the abutment surface (14) is recessed in relation to the support portion (11).
3. Wall member according to claim 2, **characterized** in that the support portion (11) is adapted to support, in use, horizontal members (10), and that the abutment portion (14) is adapted to support an wall member (1') positioned thereabove.
4. Wall member according to claim 1 or 2, **characterized** by a guiding surface between said support portion (11) and said abutment portion (14) for cooperation with a foot portion of an upper wall member (1') for guiding it to its correct position at the abutment surface.
5. Wall member according to anyone of the previous claims, **characterized** in that said pillar beams (7) extend down to the bottom level of the foot portion (5) with the same uninterrupted cross-section for forming bottom pillar abutment surfaces for cooperation with a corresponding abutment portion of a lower wall member.
6. Wall member according to claim 5, **characterized** in that said abutment portion (14) of the upper flange is provided with recesses with a shape corresponding to said bottom pillar abutment surfaces for load transmitting cooperation therebetween.
7. Wall member according to anyone of claims 1 - 4, **characterized** in that said pillar beams (7) are chamfered at the bottom portion for decreasing the transversal dimension to essentially the same dimension as said foot portion (5).

Patentansprüche

1. Wandelement (1) für Gebäude, enthaltend einen oberen Flansch (3), einen unteren Fußabschnitt (5), eine damit verbundene, im Gebrauchszustand im wesentlichen vertikale, vordere Bahn (4), die sich zwischen dem oberen Flansch und dem Fußabschnitt erstreckt, sowie mehrere, im Gebrauchszustand im wesentlichen vertikal verlaufende Ständerstützen (7), die sich von dem oberen Flansch (3) zu dem Fußabschnitt (5) erstrecken, wobei der Fußabschnitt (5) eine kleinere Abmessung in der Querrichtung im Vergleich zu dem oberen Flansch (3) aufweist und im wesentlichen ohne Verstärkungen ausgebildet ist, wodurch die Last von einem darüber angeordneten Wandelement (1') zu dem

oberen Flansch (3) und von dort über die Ständerstützen (7) zu dem darunter befindlichen Gebäudeelement (2) übertragen wird, ohne den Fußabschnitt (5) und die vordere Bahn (4) wesentlich zu belasten.

2. Wandelement nach Anspruch 1, **dadurch gekennzeichnet**, daß der obere Flansch (3) mit einem sich nach oben sowie einwärts erstreckenden Trägerabschnitt (11), der einen Innenabschnitt des Flansches bildet, sowie mit einer Widerlageroberfläche (14) versehen ist, die einen Außenabschnitt bildet, wobei die Widerlageroberfläche (14) im Verhältnis zu dem Trägerabschnitt (11) versetzt ist.
3. Wandelement nach Anspruch 2, **dadurch gekennzeichnet**, daß der Trägerabschnitt (11) in der Lage ist, im Gebrauchszustand horizontale Elemente (10) zu tragen, und daß der Widerlagerabschnitt (14) in der Lage ist, ein darüber angeordnetes Wandelement (1') zu tragen.
4. Wandelement nach Anspruch 1 oder 2, **gekennzeichnet durch** eine Führungsoberfläche zwischen dem Trägerabschnitt (11) und dem Widerlagerabschnitt (14), welche mit einem Fußabschnitt eines oberen Wandelements (1') zusammenwirkt, um dieses in seine korrekte Position an der Widerlageroberfläche zu führen.
5. Wandelement nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet**, daß sich die Ständerstützen (7) nach unten zu dem Bodenniveau des Fußabschnitts (5) mit dem gleichen, ununterbrochenen Querschnitt erstrecken, um untere Ständerwiderlageroberflächen zum Zusammenwirken mit einem entsprechenden Widerlagerabschnitt eines unteren Wandelementes zu bilden.
6. Wandelement nach Anspruch 5, **dadurch gekennzeichnet**, daß der Widerlagerabschnitt (14) des oberen Flansches mit Ausnehmungen in einer Form versehen ist, die der Form der unteren Ständerwiderlageroberflächen entspricht, um zum Übertragen von Kräften zwischen ihnen zusammenzuwirken.

7. Wandelement nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet**, daß die Ständerstützen (7) an dem unteren Abschnitt zur Verringerung der Querabmessung auf im wesentlichen die gleiche Abmessung wie der Fußabschnitt (5) abgeschrägt sind.

Revendications

1. Mur (1) pour constructions, comprenant un rebord supérieur (3), une partie de semelle inférieure (5), une partie de façade (4) dépendante sensiblement verticale en utilisation et s'étendant entre le rebord supérieur et la partie de semelle, et plusieurs poutrelles de soutien (7) sensiblement verticales en utilisation et s'étendant entre le rebord supérieur (3) et la partie de semelle (5), dans lequel la partie de semelle (5) présente une plus petite dimension dans la direction transversale comparée au rebord supérieur (3) et elle est sensiblement dépourvue de renforts, de sorte que la charge produite par un mur (1') disposé au-dessus est transmise au rebord supérieur (3) et, de ce fait, à l'élément de construction (2) du dessous par l'intermédiaire des poutrelles de soutien (7) sans que la partie de semelle (5) et la partie de façade (4) ne soient sensiblement chargées. 5 10 15 20
2. Mur selon la revendication 1, caractérisé en ce que le rebord supérieur (3) est pourvu d'une partie de support (11) s'étendant verticalement et vers l'intérieur et qui constitue une partie interne du rebord supérieur, et d'une surface de contact (14) qui constitue une partie externe, de sorte que la surface de contact (14) soit en retrait par rapport à la partie de support (11). 25 30
3. Mur selon la revendication 2, caractérisé en ce que la partie de support (11) est adaptée pour supporter, en utilisation, des éléments horizontaux (10), et en ce que la partie de contact (14) est adaptée pour supporter un élément de mur (1') disposé au-dessus. 35
4. Mur selon les revendications 1 ou 2, caractérisé en ce qu'il comporte une surface de guidage ménagée entre la partie de support (11) et la partie de contact (14) et qui coopère avec une partie de semelle d'un élément de mur supérieur (1') pour le guider à sa position correcte sur la surface de contact. 40
5. Mur selon l'une quelconque des revendications précédentes, caractérisé en ce que les poutrelles de soutien (7) s'étendent vers le niveau de fond de la partie de semelle (5) avec la même ininterrompue section transversale de manière à constituer les surfaces de contact de fond pour coopérer avec une partie de contact correspondante d'un élément de mur inférieur. 45 50
6. Mur selon la revendication 5, caractérisé en ce que la partie de contact (14) du rebord supérieur est pourvue d'évidements dont la forme correspond aux surfaces de contact de fond des poutrelles afin de coopérer entre elles pour une transmission de 55

charge.

7. Mur selon l'une quelconque des revendications 1 à 4, caractérisé en ce que les poutrelles de soutien (7) sont chanfreinées à la partie inférieure afin de diminuer la dimension transversale et l'amener sensiblement à la même dimension que la partie de semelle (5).

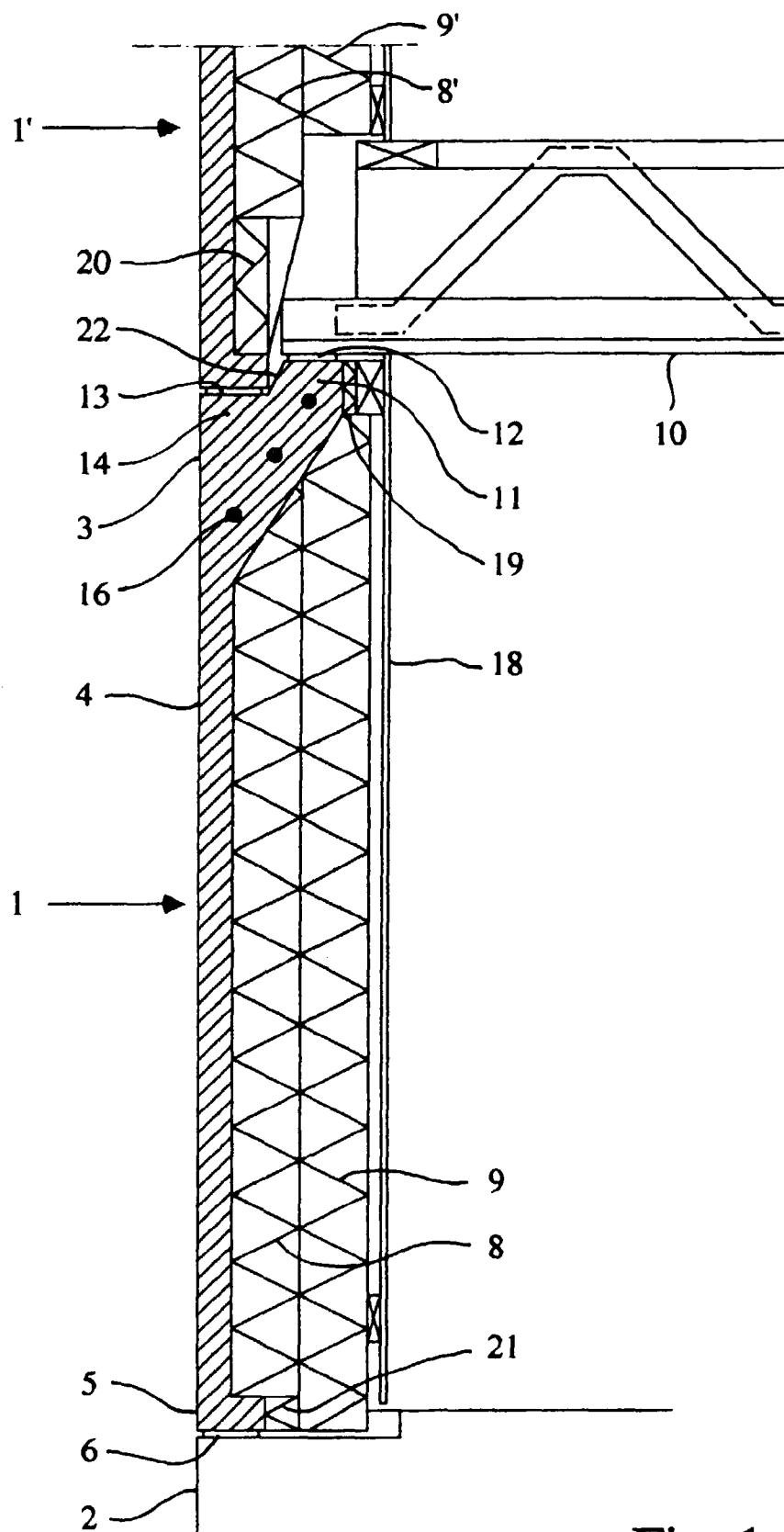


Fig. 1

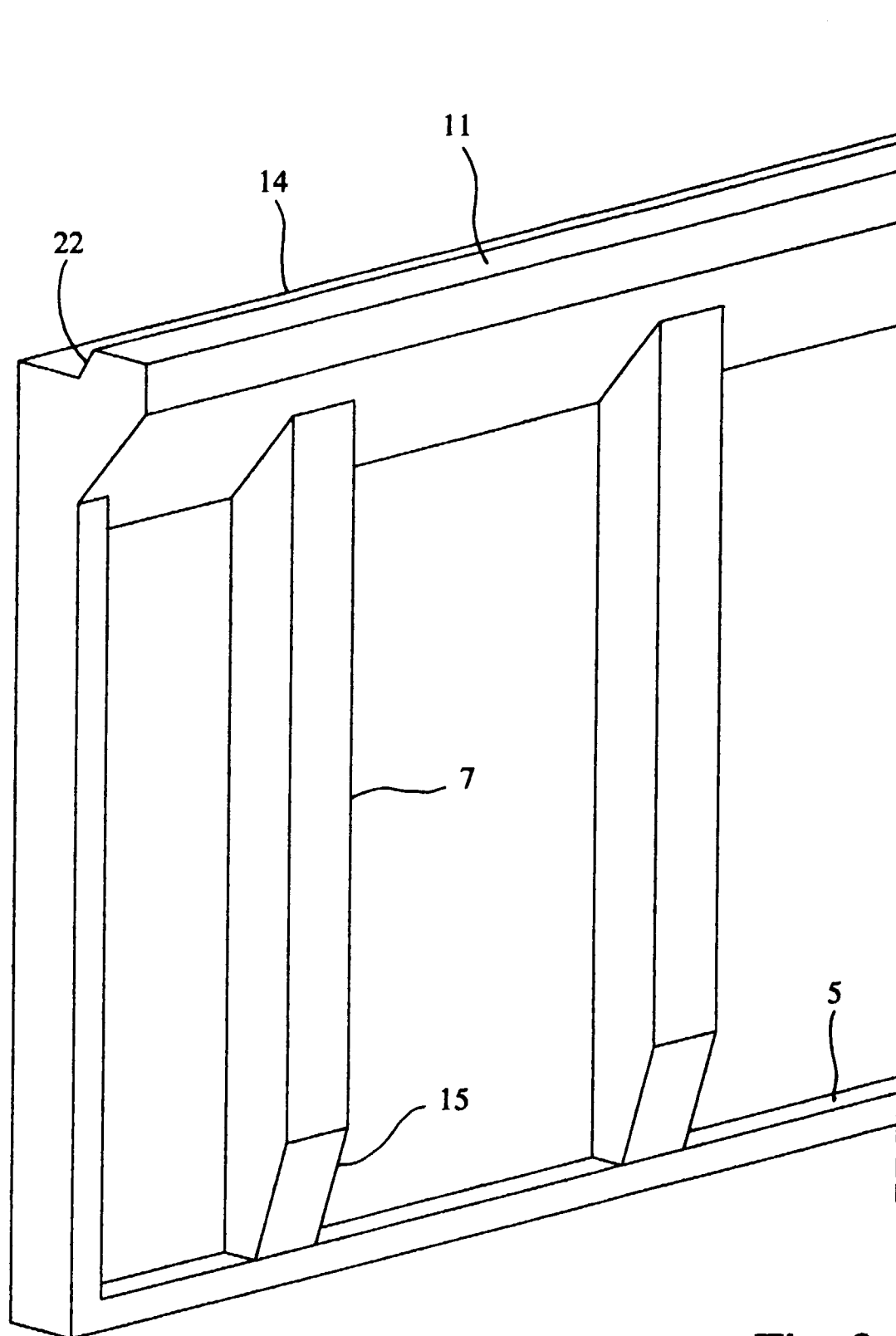


Fig. 2

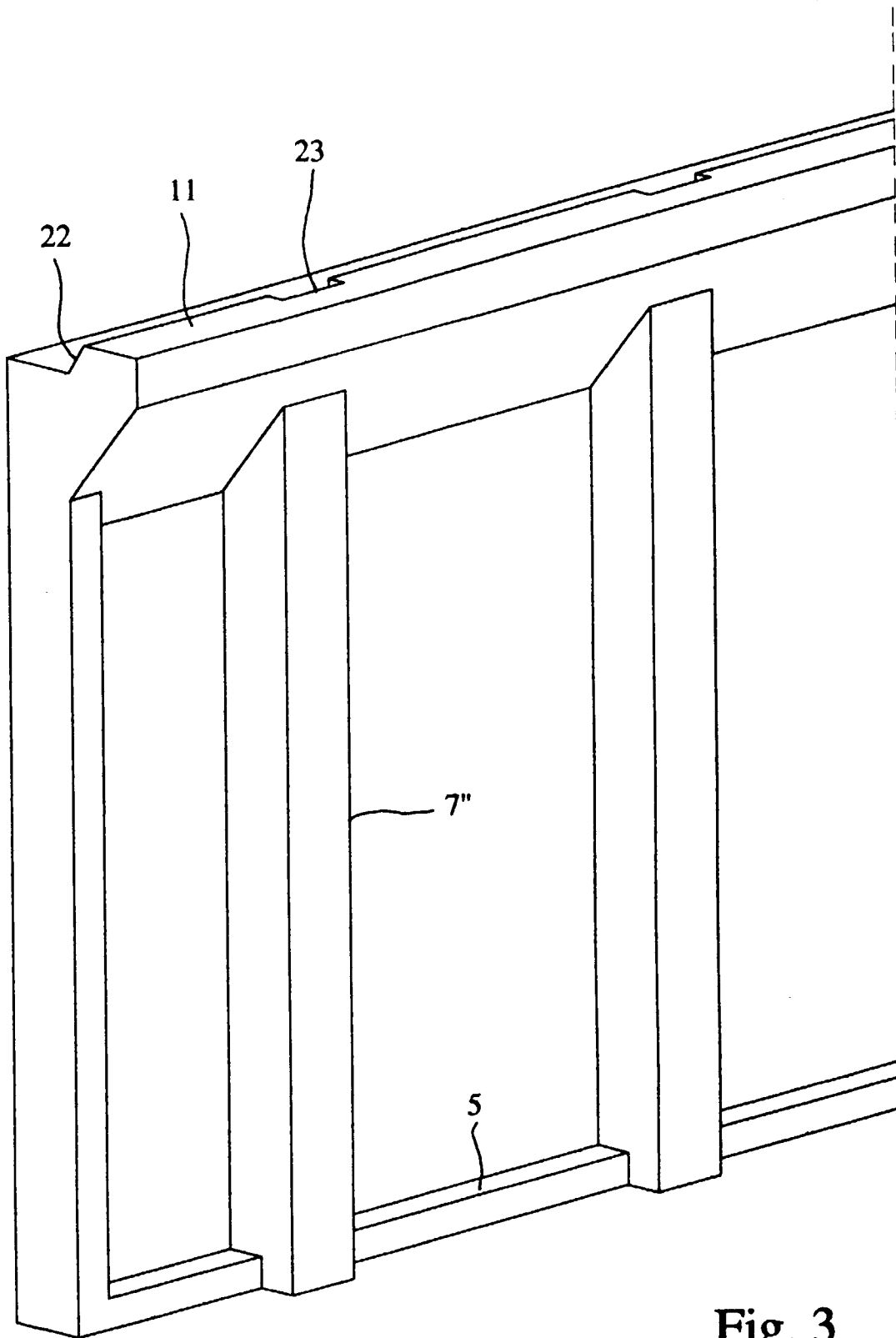


Fig. 3