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⑦③ Proprietor: **EVANS BAY TIMBER COMPANY LIMITED**
40 Kilbirnie Crescent
Kilbirnie Wellington (NZ)

⑦② Inventor: **Clark, Erin Colin**
7 Samoa Street
Kilbirnie Wellington (NZ)
Inventor: **Pyne, Graham Frederick**
20 Chapman Street
Johnsonville Wellington (NZ)

⑦④ Representative: **Ayers, Martyn Lewis Stanley et al**
J.A. KEMP & CO. 14 South Square Gray's Inn
London, WC1R 5EU (GB)

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Description

The present invention relates to improvements in and/or relating to crib walls and in particular to crib walls made from timber components.

5 We have previously designed a header support block and various crib wall component combinations including such header support blocks which enable the cheaper erection of a crib wall and also enable such crib wall to be built to greater heights than would otherwise be the case. Such a header support block however is in the form of a substantially rectanguloid wooden block having a pair of opposed rebates to enable the same to be located between two vertically adjacent headers in part straddling with each rebate
10 one of said two vertically adjacent headers at any suitable position along the length thereof.

Such double rebated key blocks are difficult to manufacture. They also provide with a particular volume of timber only a certain amount of support between vertically adjacent headers. Moreover their straddling arrangement makes it easy for them to become displaced during the filling operation where backfill or other fill is dropped into an at least partially erected crib wall structure. There is therefore some
15 need whereby an improved header, header support block or alternative arrangement can be provided which will go at least some way to meeting some of the above mentioned desiderata which will at least provide the public with a useful choice.

US—A—2 034 851 discloses a crib wall header in accordance with the prior art portion of claim 1. This prior construction is designed for manufacture of the crib wall structural members by casting and contains
20 protuberances which render the structure uneconomic and impractical to prepare from wood.

The present invention, as characterised in claim 1, provides a header construction which can readily be formed, with little wastage, from lengths of timber of substantially constant cross section simply by longitudinally grooving and cutting end channels sequentially.

The term "header support block" as used herein refers to a block capable of being positioned between
25 a front stretcher and a rear end header spacing means so as to enhance the load carrying capability of the resultant structure. While it obviously serves to some extent a spacing function as it takes up load, its positioning is not essential to ensure under light load, the correct spacing of the tiered headers.

The header is formed in wood and is of a configuration substantially as hereinafter described.

In a further aspect the present invention consists in a crib wall comprising:

30 (A) a skeletal structure made up of components such that there is (i) a plurality of tiers of headers as previously defined each substantially normal to the general plane of the wall, with each header of one tier being above and/or below a header,

(B) wall wise extending stretchers each of which spans at least two headers of a tier and the corresponding at least two headers of an adjacent tier and is located between the tiers by the said front end
35 top and bottom channels of the proximate headers,

(iii) rear end header spacing means selected from wallwise extending stretchers or keys which are interposed between each pair of adjacent tiered headers and are located by said rear top and bottom channels thereof, and

(iv) header support blocks interposed between at least some of the tiered headers between a stretcher
40 and the rear end header spacing means so as to enhance the load carrying capability of the resultant structure, said header support blocks having top and bottom projecting means each to engage in the groove of each sandwiching header, and (B) fill material at least substantially filling said skeletal wall structure.

Preferably stretchers are provided to separate the tiered pairs of headers both front and rear.

45 Preferably all components of the skeletal wall structure are formed in wood.

In a further aspect the present invention consists in a pack comprising the components of a skeletal wall structure of a crib wall in accordance with the present invention.

One preferred form of the present invention will now be described with reference to the accompanying drawings in which:

50 Figure 1 is an exploded view showing the preferred form of the components in accordance with the present invention and the manner in which the preferred headers and header support blocks can be located and used in conjunction with other components such as stretchers and keyblocks,

Figure 2 is an end view of one form of crib wall formed using components in accordance with the present invention,

55 Figure 3 is a perspective view of a skeletal wall in accordance with the present invention being erected on a supporting bed and showing headers in accordance with the present invention and header support blocks being positioned, and

Figure 4 is an end elevation view of a retaining wall in accordance with the present invention showing by way of example a structure having a maximum height above ground level of 6.276 metres using headers
60 1375 millimetres long spaced at 550 millimetre centres, there being shown how when designing the wall down from the top there are three stages i.e. no header support block for each header, one header support block per header and two support blocks per header.

With the use of the components of the present invention it is possible per given volume of component material to achieve greater crib wall heights over those given in our previous design. In the preferred form
65 of the present invention the header support blocks 1 are substantially rectanguloid but include

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longitudinally extending therealong an easily machineable locating ridge, tongue or other profile 2. Indeed if desired there can be a plurality of locating means which preferably axially extend. Ideally the locating means extend axially so that mass production is facilitated. With a timber form (which is the preferred form for all components) the grain of all the components extends longitudinally of the component.

5 The header 3 has two pairs of channels 4 and 5, the channels 4 being adapted to receive a keyblock 6 and a stretcher 7 respectively. The header 3 includes at top and bottom a header support block locating means 8 which is a groove (preferably a square channel) into which the means 2 can locate the keyblock 1 so as to align longitudinally with vertically adjacent headers 3. Obviously in other forms of the present invention different complementary locating means can be provided between headers and header support
10 blocks and indeed if desired such means need not be symmetrical. The preferred form however is desirable as it lends itself to easy mass production. For example, the grooves 8 are shown as being common to the stretcher and the keyblock since it is possible with the present invention to machine all such components using the same shaping machinery. Only the header support block need be manufactured with the machines set differently.

15 It is essential to ensure an adequate footing of a crib wall in accordance with the present invention irrespective of whether or not it is to act as a retaining wall or as a facing wall. Facing walls are appropriate where the bank to be retained is inherently stable. A facing wall in such a circumstance provides protection against scour and weathering.

The preferred length of header in a system in accordance with the present invention would be selected
20 from 550, 733, 825, 1100, 1375 mm. The headers have a cross section of 92 by 46 mm and are preferably formed in chemically treated *Pinus Radiata*.

Figure 4 shows an end view of a wall built to a height of 6.1276 m above ground level using headers 1375 mm long spaced at 550 mm centres. The diagrams show the number of header support blocks per header (HSB/H) as varying from none to one to two depending on the depth of the overall wall structure.

25 Figure 4 also shows the angle of surcharge β (0° , 10° , 20° or 38° , see Table 1). A retaining wall is considered to be surcharged by any load of back fill material or retained ground above a horizontal plane projected behind and level with the top of the wall for a distance equal to the height of the wall. The angle of internal friction ϕ (25° , 30° , 35° or 40° , see Table 1) is a measure of the frictional resistance to shear between the soil particles and is dependent upon the size and shape of the particles as well as upon soil density, but
30 the finer the particle size the lower the angle of friction. Clay and silt have lower angles of friction than gravels.

With the angle of surcharge β and angle of internal friction ϕ thus defined an indication of the desired positioning and number of header support blocks per header can be read from Table 1 for landscaping walls and retaining walls and from Table 2 for facing walls.

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TABLE 1

5	Header length mm Cross section mm	β degrees	ϕ°				Distance from the top of the wall below which any stated number of header blocks are required per header (HSB/H) (metres)		
			25°	30°	35°	40°			
10			Landscaping walls height (metres)				0	1	2
	Header 550 mm 92 mm×36 mm	0 20	1.80 1.60	2.00 1.80	2.00 2.00	2.00 2.00			
15			Retaining walls height (metres)						
20	Header 733 mm 92 mm×36 mm	0 10 20 30 38	2.25 2.05 1.80 — —	2.60 2.45 2.20 — —	3.15 2.90 2.70 2.30 —	3.65 3.45 3.25 2.90 2.35		1.70	3.65
25	Header 852 mm 92 mm×36 mm	0 10 20 30 38	2.55 2.30 2.00 — —	2.95 2.80 2.50 — —	3.55 3.25 3.10 2.55 —	4.10 3.90 3.65 3.25 2.65		2.50	4.10
30	Header 1100 mm 92 mm×46 mm	0 10 20 30 38	3.55 3.25 2.80 — —	4.15 3.90 3.50 — —	4.90 4.55 4.25 3.60 —	5.75 5.50 5.10 4.55 3.70		1.80	5.75
35									
40	Header 1375 mm 92 mm×46 mm	0 10 20 30 38	4.55 4.15 3.55 — —	5.30 5.00 4.40 — —	6.30 5.80 5.50 4.60 —	6.30 6.30 6.30 5.85 4.75		1.50	4.20

TABLE 2

45	Header length mm Cross-section mm	Facing walls height (metres)	Distance from the top of the wall below which any stated number of header support blocks are required per header (HSB/H)		
			0	1	2
50					
	550 mm 92 mm×36 mm	2.00			
55					
	733 mm 92 mm×36 mm	5.50		1.70	4.30
60					
	852 mm 92 mm× 36 mm	6.30		2.50	6.30
65					
	1100 mm 92 mm×46 mm	6.30		1.80	5.20

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The back fill within the wall itself should be crushed quarried rock that will not break down under weathering, of sufficient stone size to be free draining without washing out of the wall face, but small enough not to damage or displace timber components. Well graded material (containing a good mix of intermediate sizes) between 20 mm and 100 mm stone size is considered ideal.

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Claims

1. A header for a crib wall including header support blocks (1), said header (3) being elongated and of substantially rectangular cross-section, with top and bottom faces narrower than the side faces and having in each of said top and bottom faces a lengthwise extending longitudinal key (8) and transverse notches (4, 5) adjacent each end of the header that extend transversely fully across said top and bottom faces, characterised in that the header (3) is of wood, that the keys are comprised by longitudinally extending grooves (8) and that said notches (4, 5) have a greater depth than the said grooves (8) and intersect said grooves.

2. A skeletal crib wall structure made up of wooden components, the structure comprising a plurality of tiers of headers (3) as claimed in claim 1, each substantially normal to the general plane of the wall, with each header (3) of one tier being above and/or below a header of an adjacent tier, wallwise extending stretchers (7) of rectangular cross-section, each of which spans at least two headers of a tier and the corresponding at least two headers of an adjacent tier and is located between the tiers by the said front end and bottom channels (5, 5) of the proximate headers, rear end header spacing means (6) selected from wallwise extending stretchers or keys which are interposed between each pair of adjacent tiered headers (3) and are located by said rear top and bottom channels (4, 4) thereof, and header support blocks (1) interposed between at least some of the tiered headers between a stretcher (7) and the rear end header spacing means (6) so as to enhance the load carrying capability of the resultant structure, said header support blocks (1) having top and bottom projecting means (2) each to engage in the groove (8) of each sandwiching header.

3. A crib wall structure as claimed in claim 2, characterised in that the projecting means (2) on the header support blocks (1) substantially conform to said longitudinal grooves (8).

4. A crib wall comprising a structure as claimed in claim 2 or 3, characterised in that fill material at least substantially fills said skeletal wall structure.

5. The components of a crib wall structure as claimed in claim 2 or 3, characterised by being in a pack.

Patentansprüche

1. Kopfstück für eine Gitterwand mit Kopfstücktragblöcken (1), wobei das Kopfstück (3) länglich ausgebildet ist und einen im wesentlichen rechteckigen Querschnitt und eine Deckfläche und eine Bodenfläche aufweist, die schmaler sind als die Seitenflächen, und in jeder Deck- und Bodenfläche ein sich in Längsrichtung erstreckender länglicher Keil (8) und Querkerben (4, 5) in der Nachbarschaft jedes Endes des Kopfstückes vorgesehen sind, die sich in Querrichtung vollständig über die Deck- und Grundfläche erstrecken, dadurch gekennzeichnet, dass das Kopfstück (3) aus Holz ist, dass die Keile durch sich in Längsrichtung erstreckende Rillen (8) gebildet sind, und dass die Kerben (4, 5) eine grössere Tiefe besitzen als die Rillen (8) und die Rillen kreuzen.

2. Gerüstartiges Gitterwandgebilde aus hölzernen Bauteilen, wobei das Gebilde eine Vielzahl von Reihen von Kopfstützen (3) nach Anspruch 1 aufweist, von denen jede im wesentlichen senkrecht zur Wandebene ausgerichtet ist, wobei jede Kopfstütze (3) einer Reihe sich über und/oder unter eine Kopfstütze einer benachbarten Reihe befindet, mit wandartig sich erstreckenden Streckeinrichtungen (7) rechteckigen Querschnittes, von denen jede mindestens zwei Kopfstützen einer Reihe und die entsprechenden mindestens zwei Kopfstützen einer benachbarten Reihe überspannt und die zwischen den Reihen durch das Vorderende und die Bodenkanäle (5, 5) des nächsten Kopfstückes angeordnet ist, mit rückseitigen Kopfstückabstandseinrichtungen (6), die von den wandartig sich erstreckenden Streckeinrichtungen oder Keilen ausgewählt sind, die zwischen jedem Paar von benachbarten Kopfstücken (3) einer Reihe eingefügt und durch ihre rückseitigen Deck- und Bodenkanäle (44) angeordnet sind, und mit Kopfstückdrahtblöcken (1), die zwischen mindestens einigen Kopfstücken der Reihe zwischen eine Steckereinrichtung (7) und der rückseitigen Kopfstückabstandseinrichtung (6) eingefügt sind, um die Lastaufnahmefähigkeit des resultierenden Gebildes zu erhöhen, wobei die Kopfstücktragblöcke (1) auf ihrer Oberseite und am Boden Vorsprünge (2) besitzen, die in die Rille (8) von jedem eingelegten Kopfstück eingreifen.

3. Gitterwandgebilde nach Anspruch 2, dadurch gekennzeichnet, dass die Vorsprünge (2) an den Kopfstücktragblöcken (1) im wesentlichen den länglichen Rillen (8) entsprechen.

4. Gitterwand mit einem Gebilde nach Anspruch 2 oder 3, dadurch gekennzeichnet, dass Füllmaterial mindestens im wesentlichen das gerüstartige Gitterwandgebilde ausfüllt.

5. Bauteile für ein Gitterwandgebilde nach Anspruch 2 oder 3, dadurch gekennzeichnet, dass die Bauteile in einer Packung verpackt sind.

Revendications

1. Solive pour mur en caisson comprenant des cales (1) de support de solives, ladite solive (3) étant

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allongée et à section transversale sensiblement rectangulaire, avec des faces supérieure et inférieure plus étroites que les faces latérales et ayant dans chacune desdites faces supérieure et inférieure un logement longitudinal (8) s'étendant dans le sens de la longueur et des entailles transversales (4, 5) contiguës à chaque extrémité de la solive qui s'étendent transversalement d'une extrémité à l'autre desdites faces supérieure et inférieure, caractérisée en ce que la solive (3) est en bois, en ce que les logements sont constitués par des rainures (8) s'étendant longitudinalement, et en ce que lesdites entailles (4, 5) ont une profondeur supérieure à celle desdites rainures (8) et coupent lesdites rainures.

2. Ossature de mur en caisson constituée d'éléments en bois l'ossature comportant une pluralité de rangs de solives (3) selon la revendication 1, chacun étant sensiblement perpendiculaire au plan général du mur, chaque solive (3) d'un rang étant au-dessus et/ou au-dessous d'une solive d'un rang contigu, des tendeurs (7) à section transversale rectangulaire s'étendant dans le sens du mur, chacun d'eux enjambant au moins deux solives d'un rang et au moins les deux solives correspondantes d'un rang contigu et étant disposé entre les solives à l'aide desdites entailles supérieure et inférieure (5, 5) d'extrémité antérieure des solives voisines, un moyen extrême postérieur (6) d'espacement de solives choisi parmi les tendeurs ou logements s'étendant dans le sens du mur qui sont intercalés entre chaque paire de solives (3) de rangs contigus et sont mis en place à l'aide desdites entailles supérieures et inférieures (4, 4) postérieures de celles-ci, et des cales (1) de support de solives intercalées entre au moins certaines de solives disposées en rangs entre un tendeur (7) et le moyen extrême postérieur (6) d'espacement de solives de façon à renforcer la capacité de support de charges de l'ossature obtenue, lesdites cales (1) de support de solives ayant des moyens saillants (2) supérieur et inférieur destinés chacun à entrer dans la rainure (8) de chaque poutre située de part et d'autre.

3. Ossature de mur en caisson selon la revendication 2, caractérisée en ce que les moyens saillants (2) présents sur les cales (1) de support de solives épousent sensiblement lesdites rainures longitudinales (8).

4. Mur en caisson comportant une ossature selon la revendication 2 ou 3, caractérisé en ce qu'un matériau de remplissage remplit au moins à peu près ladite ossature de mur.

5. Eléments constitutifs d'une ossature de mur en caisson selon la revendication 2 ou 3, caractérisés en ce qu'ils sont en paquet.

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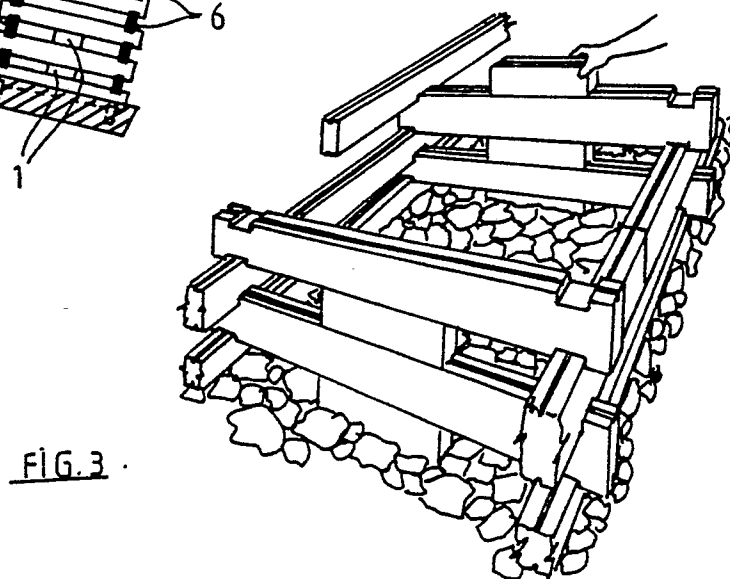
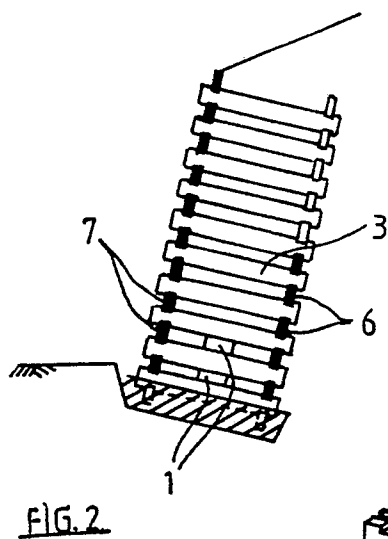
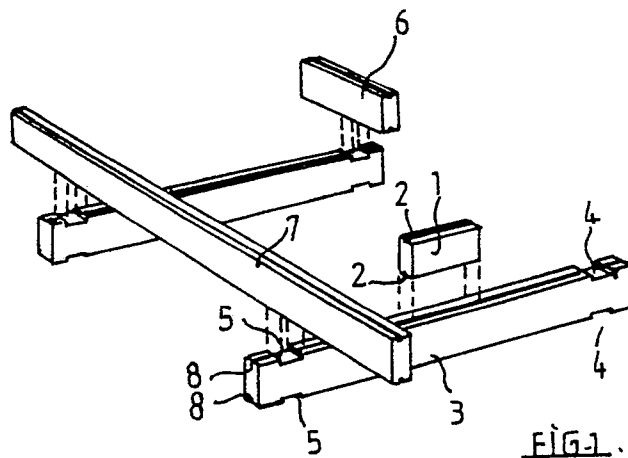
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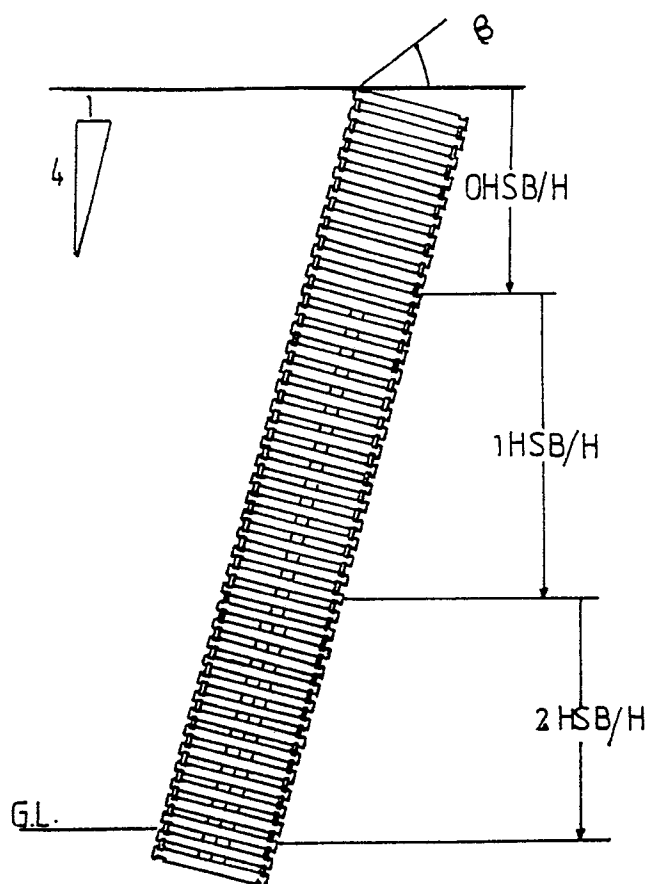


FIG 4