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(54) Abstract Title: **A bracket for use in decking and other timber constructions**

(57) A bracket (10) in the form of a joist hanger for use in timber construction such as decking is presented. The bracket includes a continuous back plate (12) for location against an inner wall of a supporting heading member such as a sill, side walls (30,32) for connecting to a joist and a locating tab (84) against which the joist is aligned to ensure alignment between the surface of the joist and sill for locating timber boards upon. Further features provide for a load bearing fixing between the joist and bracket by providing a fastener (94) extending through the joist and the side walls to support the joist. Further the bracket is formed from single sheet metal and adapted to fold for use in corners. A method of constructing a timber platform such as decking by pre-fixing the brackets to the joists is also described.

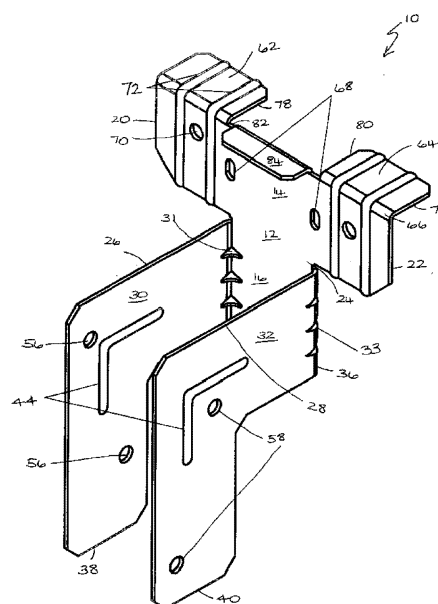


FIGURE 1

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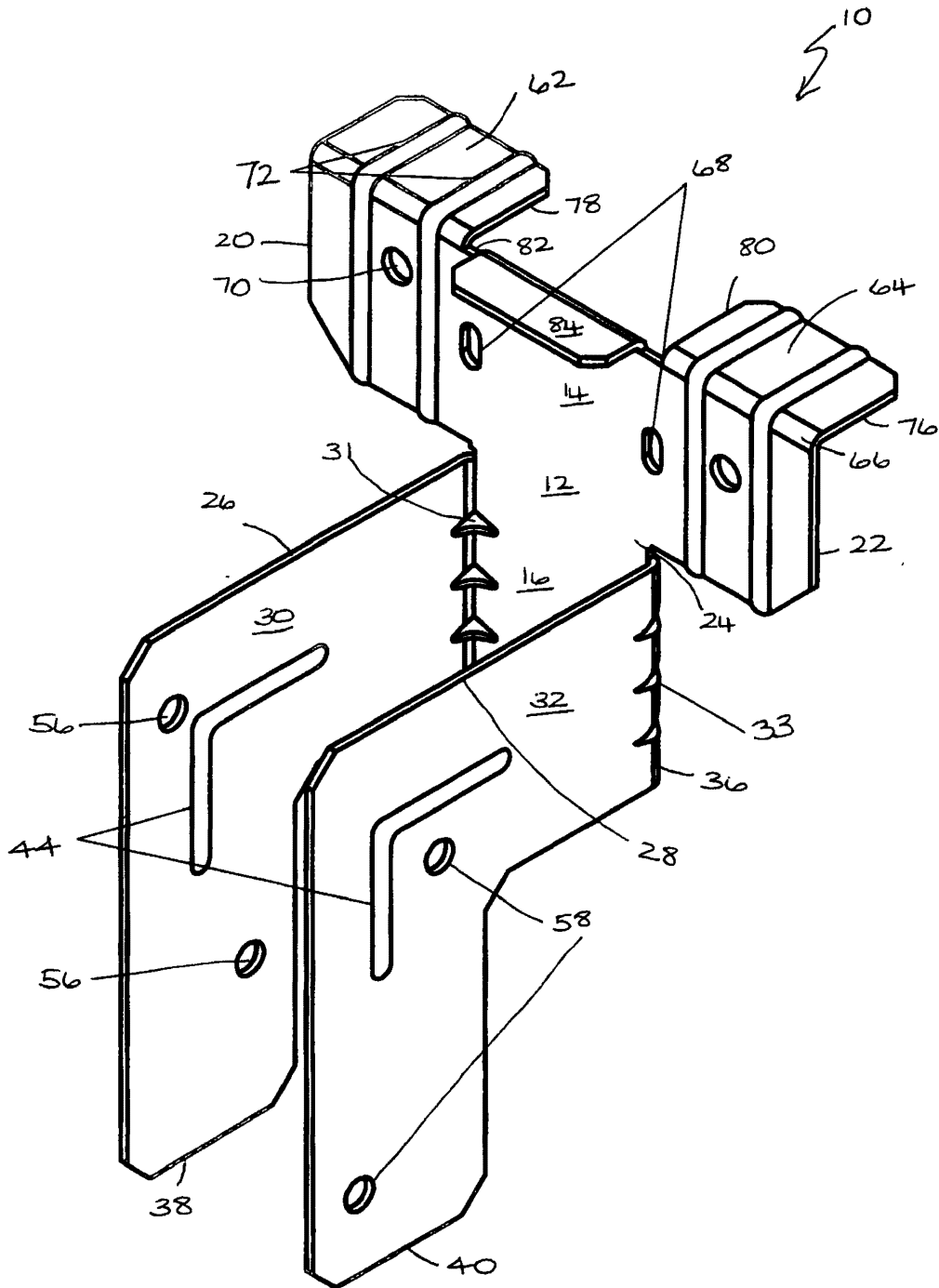


FIGURE 1

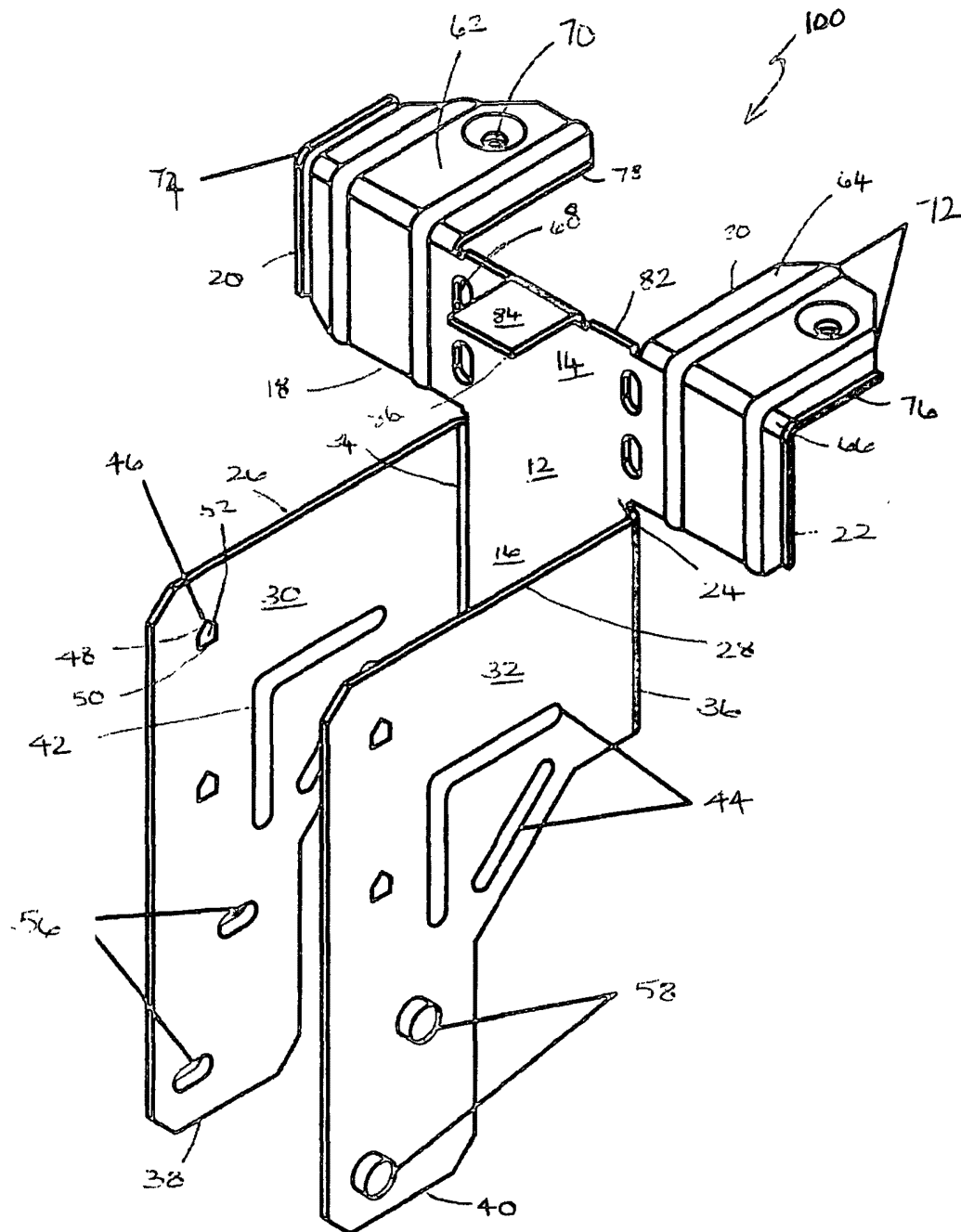
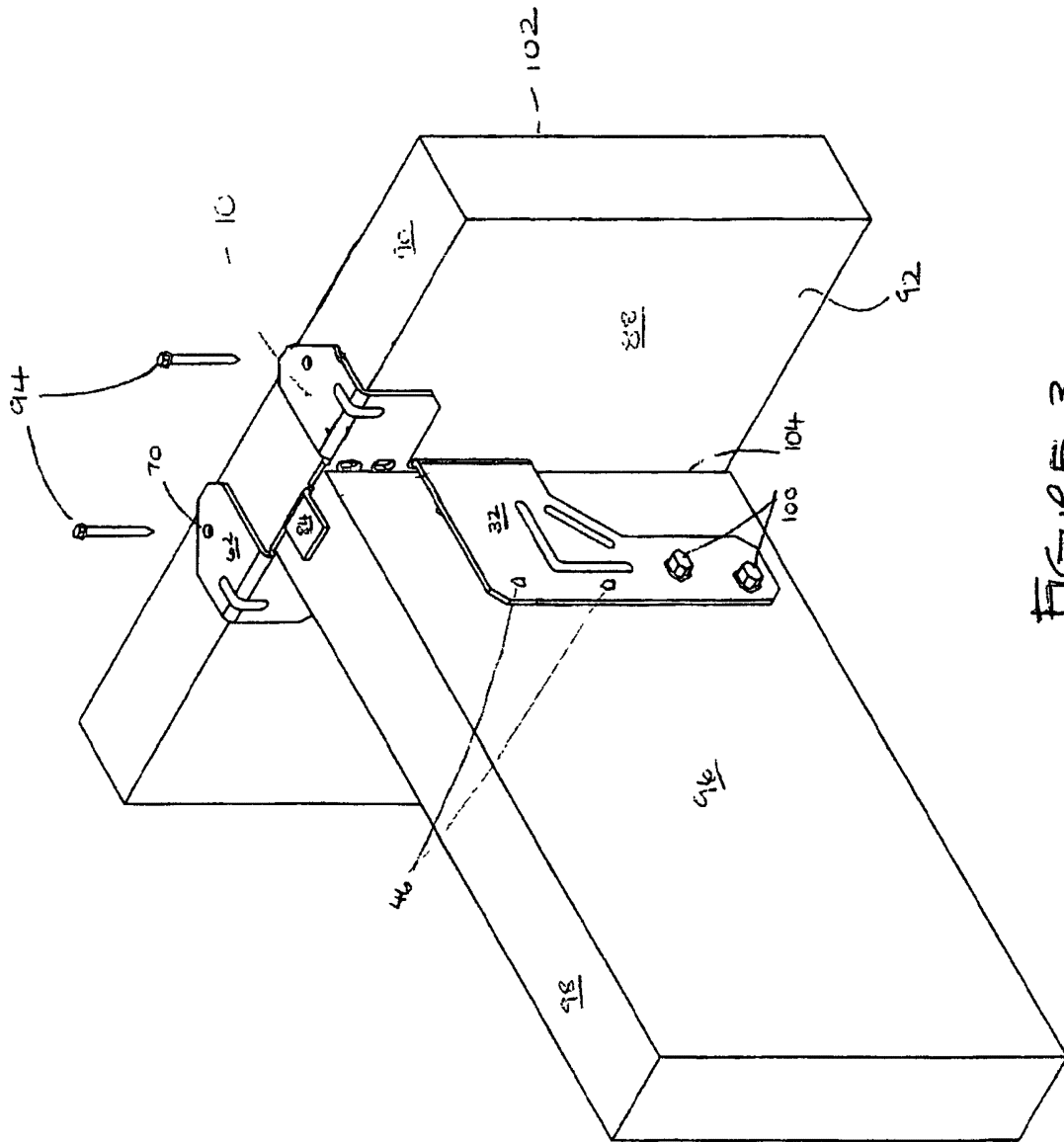


FIGURE 2



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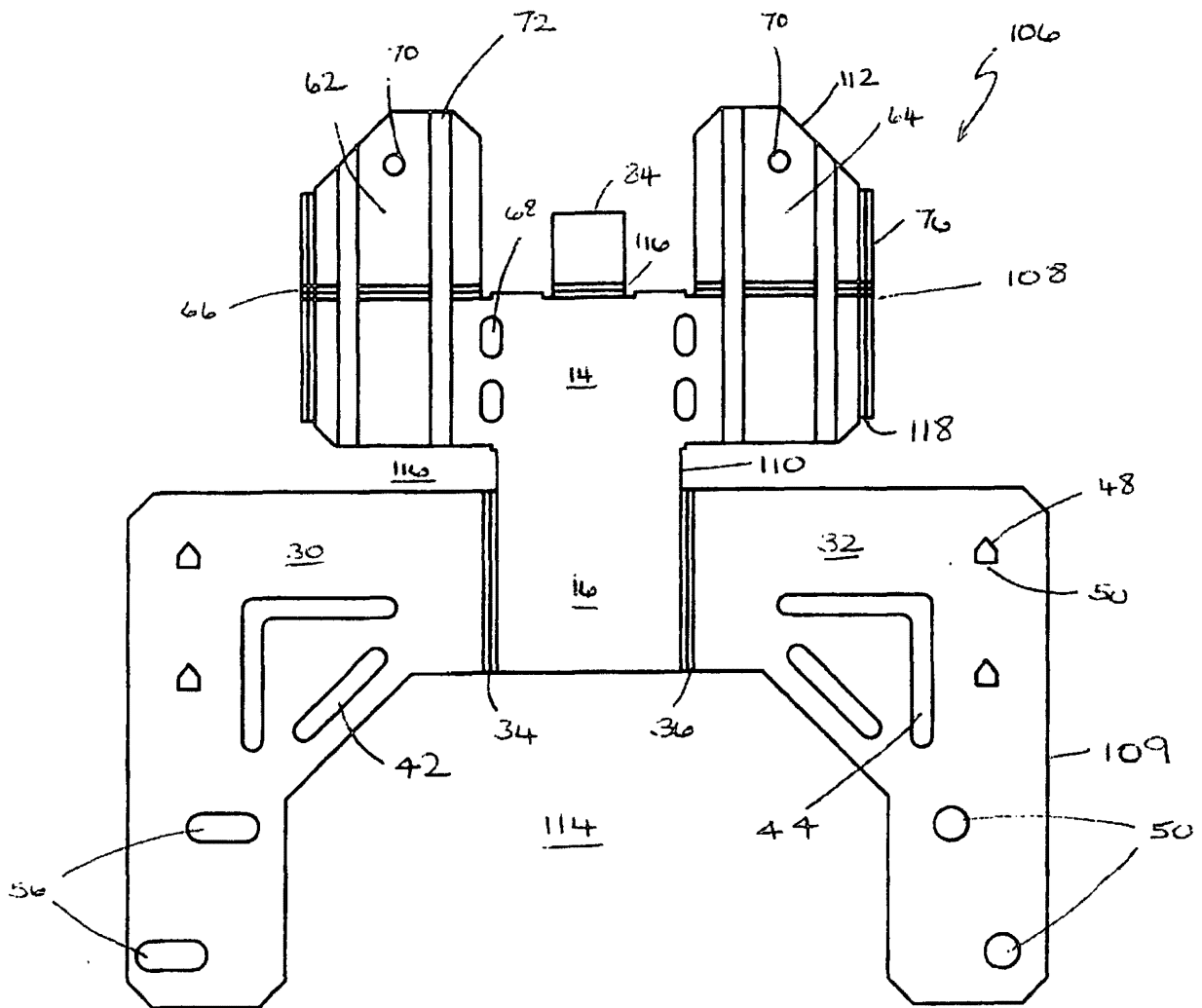


FIGURE 4.

BRACKET FOR USE IN DECKING AND OTHER TIMBER CONSTRUCTION

5 The present invention relates to timber building construction, and more particularly, through not exclusively, to a bracket for use in constructing decking.

10 Wooden decking has become more popular recently and as a result a need has been established for simple construction aids to provide for easy and rapid decking construction. Typically a decking platform is formed by first providing a wooden end sill, defining the outer boundary of the decking. Joists are then located across the area, between opposing sills, and connected to the inwardly directed faces of the respective sill. Finally timber panels or boards are laid over the joists and sills to construct the
15 floor or decking. These floor timbers are secured to the sills and joists.

To aid construction front facing hangers are used. These are standard joist hangers comprising a seat portion, two side walls extending perpendicularly upwards from the seat and two back plates, each
20 extending perpendicularly from a side wall, and provided with fixings to attach the back plates against the inner face of the sill. The seat and side walls provide a cradle into which a joist is inserted. The joist is then nailed or fastened to the side walls and seat of the hanger.

25 It will be appreciated that the decking construction requires the hanger be located upon the sill such that the distance between the top of the sill and the seat of the hanger equals the height of the joist. This provides the level surface for the timber flooring to be attached. In order to assist a user, the joist hanger may include bearing plates projecting backwards i.e.

opposite to the seat, from the upper ends of the back plates. Thus for a known joist height, the hanger can be aligned on the upper edge of the sill.

5 A number of disadvantages exist with this method of construction. As the joist is nailed in the seat of the hanger it is difficult to ensure that the top surface of the joist aligns perfectly with the upper edge of the sill. As a result unwanted gaps exist between the decking timbers and the joists/sills which require to be packed to prevent unwanted movement in the structure. The joists can also creep upwards from the base of the seat of
10 the hanger. The load of the joist and decking is then not supported by the hanger and sills, but instead is transferred to the fixings between the joists and hanger, which can cause these nails to break and thereby release the hanger. Yet further, as the construction is exposed in use, damp conditions can cause the joist to shrink which loosens the decking.

15 In the prior art arrangement the hangers are first fixed to the sill and then the joist is lowered in. Once the hangers are fitted it can be difficult to gain sufficient access to secure the joist to each hanger. Additionally, while it is easy to first fix in hangers and then locate the joist between them for
20 veranda or porch decking, it poses a disadvantage for balconies or other raised decking, as the workmen require scaffolding to take their weight to reach in to mount the hangers.

It is thus an object of the present invention to provide a bracket for use on
25 decking which obviates or mitigates disadvantages of the prior art joist hangers.

It is a further object of at least one embodiment of the present invention to provide a method of constructing a decking platform which allows joists to
30 be arranged in the hangers and then mounted on the sills in a single step..

According to a first aspect of the present invention there is provided a bracket for use in timber construction, the bracket comprising a continuous back plate for location against an inner wall of a supporting heading member; at least one bearing plate extending perpendicularly from the back plate in a rearward direction for location upon the supporting heading member; first and second side walls extending from opposing edges of the back plate in a forward direction for locating a joist there between; and a locating tab including a first surface against which a joist can be aligned, the locating tab being arranged adjacent to the at least one bearing plate in the forward direction.

The locating tab provides a reference point or datum which is coincident for the joist and the timber boards, such as decking, located upon the supporting heading member which may be a sill. This ensures that the joist and the decking placed upon it are correctly aligned. Further, by removing the seat from a hanger, a joist can be introduced to the hanger from below, offering straight through alignment. The joist can therefore be connected to the hanger and then the combined structure dropped between the sills.

Preferably, the locating tab includes an upper surface which is co-planar to an upper surface of the at least one bearing plate. This provides a level surface for attachment of the decking.

Preferably, the side walls extend from a lower portion of the back plate and the back plate includes an extended upper portion to provide a larger surface area for attachment to the sill. Advantageously, there are two bearing plates each extending from opposing ends of the upper portion.

Preferably the bracket is made from a single metal sheet. Preferably also the extended upper portion includes fold lines, so that the bearing plates may be positioned at a desired angle relative to the location tab.

Advantageously the fold lines align with the edges between the back plate and the side walls. Such an arrangement allows the bracket to be located in a corner at the meeting point of two sills.

Preferably, the bracket includes one or more barbs. Preferably the one or more barbs are arranged to allow insertion of a joist into the bracket, but prevent its withdrawal. Preferably the one or more barbs are arranged at the meeting points of the sidewalls and the back plate. Alternatively, the one or more barbs are arranged on an inner face of the side walls.

Preferable the bracket includes load bearing fixing means. Preferably the fixing means comprises a member arranged to extend from the first side wall to the second side wall. In this way the fixing means passes through the joist, from one face to an opposing face. Preferably the member is a screw but may be any type of appropriate fastener. Advantageously an aperture is located through the first side wall through which the member may pass.

More preferably guide means are arranged at the aperture to assist in aligning the fixing means through the joist. The guide means may be an extruded obround hole. Preferably the obround hole is arranged horizontally so that loading is not compromised. Preferably an extruded round hole is arranged in the second hole opposite the aperture for receiving the member. The guide means may also comprise a shield being a substantially cylindrical section through which the fixing means can be inserted for construction and then removed. In an embodiment the member is a self tapping screw.

A lip may be located at an end of the/each bearing plate opposite the back plate. The lip may be parallel with the back plate to provide a hook arrangement. In this way the bracket may be located over a sill to connect the rear face of the sill to the joist.

According to a second aspect of the present invention there is provided a joist hanger for supporting a joist against a bearing member or wall, the joist hanger comprising a back plate for location against the bearing member; the back plate including two parallel fold lines crossing upper and lower portions of the back plate; at least two bearing plates extending perpendicularly from the back plate for location upon the bearing member; first and second side walls being folded lower portions of the back plate for locating a joist there between; and characterised in that the upper portion of the back plate may be folded in the same direction as the adjacent side wall so that the hanger can be used where the bearing member is arranged in a corner location.

This joist hanger allows a user to select the orientation of a portion of the back plate, and a bearing plate, with respect to the location of the joist. Thus the same hanger can be used for locations where the bearing member meets a cross member at right angles or where it may be advantageous to place joists side-by-side.

The joist hanger may include a seat portion. Alternatively, or additionally, the joist hanger may include a location tab. Where the joist hanger is formed from sheet metal the seat and/or tab can be folded into position also.

The joist hanger may include one or more barbs. Preferably the one or more barbs are arranged to allow insertion of a joist into the bracket, but prevent its withdrawal. Preferably the one or more barbs are arranged at the meeting points of the sidewalls and the back plate. Alternatively, the one or more barbs are arranged on an inner face of the side walls.

Preferable the joist hanger includes load bearing fixing means. Preferably the fixing means comprises a member arranged to extend from the first side wall to the second side wall. In this way the fixing means passes through the joist, from one face to an opposing face. Preferably the member is a screw but may be any type of appropriate fastener. Advantageously an aperture is located through the first side wall through which the member may pass.

More preferably guide means are arranged at the aperture to assist in aligning the fixing means through the joist. The guide means may be an extruded obround hole. Preferably the obround hole is arranged horizontally so that loading is not compromised. Preferably an extruded round hole is arranged in the second hole opposite the aperture for receiving the member. The guide means may also comprise a shield being a substantially cylindrical section through which the fixing means can be inserted for construction and then removed. In an embodiment the member is a self tapping screw.

According to a third aspect of the present invention there is provided a joist hanger for supporting a joist against a bearing member or wall, the joist hanger comprising a back plate for location against the bearing member with first and second side walls extending from opposing edges of the back plate for locating a joist there between and load bearing fixing means comprising a member arranged to extend from the first side wall to

the second side wall, through the supported joist and thereby bear a majority of the load of the joist at the hanger.

5 In this way, the joist hanger provides improved load bearing capacity over arrangements of nails driven in through the side walls.

10 Preferably the member is a screw but may be any type of appropriate fastener. Advantageously an aperture is located through the first side wall through which the member may pass. More preferably guide means are arranged at the aperture to assist in aligning the fixing means through the joist. The guide means may be an extruded obround hole. Preferably the obround hole is arranged horizontally so that loading is not compromised. Preferably an extruded round hole is arranged in the second hole opposite the aperture for receiving the member. The guide means may also
15 comprise a shield being a substantially cylindrical section through which the fixing means can be inserted for construction and then removed. In an embodiment the member is a self tapping screw.

20 The joist hanger may include a seat portion. Alternatively, or additionally, the joist hanger may include a location tab. Where the joist hanger is formed from sheet metal the seat and/or tab can be folded into position also.

25 Preferably, the side walls extend from a lower portion of the back plate and the back plate includes an extended upper portion to provide a larger surface area for attachment to the sill. Advantageously, there are two bearing plates each extending from opposing ends of the upper portion.

30 Preferably the bracket is made from a single metal sheet. Preferably also the extended upper portion includes fold lines, so that the bearing plates

may be positioned at a desired angle relative to the location tab.

Advantageously the fold lines align with the edges between the back plate and the side walls. Such an arrangement allows the bracket to be located in a corner at the meeting point of two sills.

5

The joist hanger may include one or more barbs. Preferably the one or more barbs are arranged to allow insertion of a joist into the bracket, but prevent its withdrawal. Preferably the one or more barbs are arranged at the meeting points of the sidewalls and the back plate. Alternatively, the one or more barbs are arranged on an inner face of the side walls.

10

According to a fourth aspect of the present invention there is provided a blank for a bracket, the blank comprising a single sheet metal section to form the bracket according to the first aspect of the present invention.

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According to a fifth aspect of the present invention there is provided a blank for a joist hanger, the blank comprising a single sheet metal section to form the joist hanger according to the second or third aspects of the present invention.

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According to a sixth aspect of the present invention there is provided a method of constructing a timber platform, the method comprising the steps:

25

- (a) providing at least one joist and a plurality of brackets according to the first aspect;
- (b) inserting each end of a joist between the side walls in a respective bracket;
- (c) abutting the joist with each location tab;
- (d) affixing the joist to each bracket;

- (e) dropping the joist between supporting heading members so that the brackets locate against the members; and
- (f) locating timber boards over the joist and header members.

5 In this way, the brackets do not require to be pre-mounted on the supporting heading members or sills before the joists can be inserted. This speeds up construction as a builder can use each newly laid joist to support his weight as he locates in the next joist.

10 The method may include the step of bending a side wall through 90 degrees and thereby arranging the bracket in a corner of a supporting heading member frame.

15 The method may further include the step of hanging a bracket over the supporting heading member frame such that the back plate is against an inner face of the supporting heading member and the lip against an outer face of the supporting heading member. The method may further include the step of affixing a handrail, post or other enclosure upon the supporting heading member.

20 Preferably the method includes the step of locating a self tapping screw through the side walls and the joist to thereby bear the load of the joist upon the screw.

25 Various embodiments of the present invention will now be described, by way of example only, with reference to the following drawings of which:

Figure 1 is a perspective view of a bracket according to an embodiment of the present invention;

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Figure 2 is a perspective view of a bracket according to a further embodiment of the present invention;

Figure 3 is a schematic view of a portion of a decking platform including a bracket according to a further embodiment of the present invention; and

Figure 4 is a plan view of a blank for arrangement of the bracket of Figure 2.

Reference is initially made to Figure 1 of the drawings which illustrates a bracket, generally indicated by reference numeral 10, according to a first embodiment of the present invention. Bracket 10 is formed from a single sheet of metal, the thickness being chosen to provide sufficient strength while allowing the material to be folded at marked locations.

Bracket 10 includes a back plate 12 for location against a supporting heading member or bearing member (not shown). Back plate 12 comprises an upper portion 14 and a lower portion 16, defined by the cut line 18 which travels horizontally through the plate 12 from either side 20, 22 leaving a central portion 24 of the back plate 12 which extends vertically for its full length. Cut line 18 also marks the top 26, 28 of each of the side walls 30, 32. The side walls 30, 32 are created by folding the lower portion 16 of the back plate 12 along vertical fold lines 34, 36 which lie parallel and to each side of the central portion 24 of the back plate 12. The side walls 30, 32 extend forward of the back plate 12 sitting parallel to each other and perpendicular to the back plate 12. The back plate 12 is thus a continuous plate which binds the side walls 30, 32 together.

Side walls 30, 32 project from the back plate 12 and then extend downwardly to provide legs 38, 40. These legs 38, 40 provide an

increased surface area to support a joist located between the walls 30, 32. Accordingly the central portion 24 of back plate 12 has a width sized to the width of the joist to be supported. Strengthening ribs 42, 44 are arranged on the walls 30, 32. The strengthening ribs 42, 44 are raised portions in the metal, typically to a height of 1.5mm from the surface of the side wall, which provide additional strength at the point where the legs 38, 40 extend away from the back plate 12. Use of the ribs 42, 44 removes the need to increase the surface area of the side walls 30, 32 and thereby provides better access by a user to insert a joist up between the side walls 30, 32.

Arranged at the apex or corners, on the fold lines 34, 36 are a series of barbs 31,33 respectively. In the embodiment shown there are three barbs on each fold line. These barbs are created by perpendicular slits over across the fold line and then, when the side walls 30,32 are folded in the barbs are pushed forward, resisting the fold. These barbs 31,33 also act as 'bird beaks' which strengthen the bend created at the fold line 34,36 as is known in the art.

Also located upon the side walls 30,32 are apertures 56,58. These pairs of apertures are used to provide for nails, screws of other fixing means to be inserted through the bracket and into the joist. The bracket 10 is thus attached to the joist at these points.

At the upper portion 14 of the back plate 12 are arranged two bearing plates 62, 64. The bearing plates 62, 64 are extensions of the back plate 12 which are created by folding the back plate horizontally along line 66 in a rearward direction. The bearing plates 62, 64 sit perpendicularly to the back plate 12 so that the bracket 10 can be easily located against a sill (not shown). Due to the loading applied to the bearing plates 62, 64 strengthening ribs 72, as described herein before, are located across the

fold line 66. In addition, strengthening bends 74, 76 are arranged over each end 20, 22 of the upper portion 14. These bends 74, 76 are double metal thickness areas to improve deflection and are formed by rolling or folding the sheet metal along the edges 20, 22.

5

Within the upper portion 14 are also arranged longitudinal apertures 68. These apertures 68 are aligned with the fold lines 34, 36. The apertures 60 may be used to locate fasteners between the back plate 12 and the bearing member (not shown). However, in the embodiment shown, further apertures 67, are provided to fix the back plate 12 and hence the bracket 10 to the sill or bearing member. This leaves the longitudinal or obround apertures 68 to be used to allow the back plate 12 to be folded across these apertures in-line with the fold lines 34, 36 respectively. For instance if the upper portion 14 was folded along the apertures in alignment with fold line 34, in the same direction as the side wall 30, the bracket 10 could be located in a corner where two sills meet. Advantageously therefore, the bracket 10 has two bearing plates 62, 64 with inner edges which align with the fold lines 34, 36.

Arranged between the bearing plates 62, 64 on an upper edge 82 of the central portion 24 of the back plate 12 is a location tab 84. Location tab 84 is a rectangular section of the sheet folded from the central portion 24 of the upper portion 14 of the back plate 12. The tab 84 is folded to be perpendicular with the back plate 12 in the opposing direction to the bearing plates 62, 64. It is also aligned with the bearing plates 62, 64. The tab 84 includes a lower planar surface 86 against which a joist can be arranged. The tab 84 is relatively small so that it does not obstruct a user wishing to insert fasteners through the apertures 67, 68 to affix the back plate 12 to the sill.

30

The tab 84 is arranged so that a the top surface of a joist located against it at the surface 86 will align with the top surface of the sill or bearing member. In this way the timber panels or boards fixed over the sill and joists to make the decking platform will be located on an even surface.

5 Thus a coplanar arrangement is provided between the joists and sill.

The bearing plates 62, 64 may also be extended to cover the width of the sill. In this arrangement, lips or hooks are arranged at the ends of the bearing plates to 'catch' the opposite edge of the sill. Each lip will lie
10 parallel to the back plate 12. Such an arrangement allows the bracket 10 to be used as a restraint device. In this way the bearing member cannot be pushed away from the joist, as may happen when handrails are mounted on the bearing member and pressure is applied transversely to the top of the handrail by a user.

15

Yet further a seat can be added to the bracket 10. This can be done by incorporating a 'U' bracket around the joist and using the fasteners of the load bearing arrangement 54 to tie the U-bracket to the side walls 30, 32. As the location tab 84 is formed by folding the sheet metal at the upper
20 edge 82, a user may fold the tab 84 in the opposite direction to allow one to insert joists in from above to rest upon the seat if so desired. In this way if access is limited under the decking platform the joists can be arranged from above, the tab 84 can then be folded back and the joist aligned with the tab. Following alignment, the seat can be adjusted or the
25 bearing arrangement 54 can be used to keep the joint in the correct alignment against the tab 84.

Reference is now made to Figure 2 of the drawings which illustrates a bracket, generally indicated by reference numeral 100, according to a
30 further embodiment of the present invention. In bracket 100, like parts to

those of the bracket in Figure 1, have been given the same reference numeral to aid clarity.

Two further features of the bracket 100 or of a joist hanger according to this embodiment of the present invention are also illustrated in bracket 100. These features are in relation to the side walls 30, 32. Arranged on each side wall are barbs 46 instead of there location as bird beaks on the fold lines 34,36. In the embodiment shown two barbs are arranged on each wall 30, 32 however any number may be selected dependent upon the dimensions of the hanger and joist. Each barb 46 is formed by cutting the sheet metal to form upwardly directed point or apex 48. The apex 48 is then pushed inwardly towards the opposing side wall 32 along a fold line 50. Ideally, once pushed in, the barb will sit at an angle of approximately 40 degrees to the side wall. When a joist is pushed in from below the bracket 10, the edges of the joist will slide over the back face 52 of the barb. However, if someone attempts to remove the joist by pulling the joist from below or by placing a load upon an upper surface of the joist, the apex 48 will engage with the joist and grip the joist. Thus the bards 46 act in one direction and help prevent the joist from being moved once in position.

A second feature shown in the bracket 100, which may be incorporated in a joist hanger according to an embodiment of the present invention, is a load bearing arrangement, generally indicated by reference 54. Arrangement 54 comprises a dowel (not shown) together with apertures 56, 58 in the side walls 30, 32 respectively. The dowel 54 extends from a first side wall 30 to a second side wall 32 and engages with both walls such that any load applied to the dowel is transmitted to both side walls. The dowel is located horizontally so that it can, itself, provide a load bearing capacity. Though it will be recognised that any number of dowel

and fixing arrangements could be used, an example and preferred arrangement is illustrated and described herein.

On the first wall, a long extruded obround hole 56 is formed. The
5 apertures 56 shape is selected to provide some flexibility in arranging the
dowel and so that loading is not compromised. The dowel may be any
mechanical fastener, but is preferably a self-tapping screw. Accordingly,
the joist may include a predrilled hole, if desirable, but is not essential.
Where a hole is formed in the joist, the obround hole 56 provides for errors
10 in measurement or alignment. By making the hole 56 obround the rised
walls provide a guide so that the screw is inserted perpendicularly to the
joist to improve alignment. In an alternative embodiment a cylindrical
section sized to the diameter of the screw head can be located against the
hole 56 to act as a guide means. Such a guide means can be used any
15 number of times.

On exiting the joist, the screw enters the second aperture 58 in the second
wall 32. Aperture 58 is provided as an extruded round hole. The extruded
portion faces outwardly and is sized such that the screw will engage and
20 gain purchase from the extruded portion. Additionally, the screw length is
chosen such that the screw will extend beyond the joist by a sufficient
distance to mate with the second wall 32, but will cause an obstruction.
As can be seen in the Figure, two such arrangements 54 are placed on
the legs 38, 40 in a staggered configuration. This arrangement creates two
25 shear planes between the side planes for added support. Additionally by
locating one or more of the apertures 56,58 towards the base 38,40 of the
side walls 30,32, increased support is provided at the base of the joist
which improves the bearing capacity of the bracket 10,100.

In use, bracket 100 is located onto a bearing member 88 such as a sill as illustrated in Figure 3. As can be seen the bracket 10 is located on the corner of the sill 88 by dropping the bracket 10 upon the upper surface 90 of the sill 88 so that the bearing plates 62,64 lie upon the surface 90. The bearing plates 62, 64 are aligned by ensuring that a back face of the back plate 12 sits flush with the inner surface 92 of the sill 88. The bracket 10 can then be attached to the sill 88 by inserting fasteners 94 through apertures 70 on the bearing plates 62, 64 to engage the sill 80. Fasteners can be used through the apertures 68 if it is desired that additional support is required.

The joist 96 is located into the bracket 10 by moving the joist 96 upwards relative to the bracket 10 from below. As the joist 96 slides between the side walls 30, 32 it is guided and aligned against the back plate 12. The joist 96 will ride over the barbs 46 in unheeded passage until the upper surface 98 of the joist 96 abuts the lower surface 86 of the location tab 84. With the joist 96 rested against the location tab 84, the top surface 98 of the joist 96 is in alignment with the top surface 90 of the sill 88. The barbs 46 prevent the joist from dropping out of alignment until such time as the dowels 100, usually in the form of self-tapping screws are inserted through the joist 96 to bear the load of the joist as described hereinbefore.

While Figure 3 illustrates the bracket 100 being located on the sill 88 with the joist 96 in place, it will be appreciated that two methods of assembly are available. The first is to connect the joist 96 to the bracket 10,100 and then drop the bracket/joist assembly onto the sill. The second is to connect the bracket 10 to the sill 88 and then introduce the joist from below, connecting the joist to the bracket when aligned against the tab 84. The required alignment between the top surfaces 90, 98 of the sill and joist is achieved with either method. The choice of method will be made on the

access available to the sill. For decking platforms arranged at ground level or on high balconies, the first method can be used which allows all the work to be carried out from above. This is an added safety feature for balcony work as the joists are fully supported on the bearing plates when inserted and will support the weight of a worker while they affix brackets to the sill. The second method allows the joists to be inserted from below if this is required.

The first method can also be used when the joist 96 is to be located in parallel with a sill in a corner of a platform. In this arrangement, one bearing plate 62 will be turned through 90 degrees by folding the bracket along fold line 34, extending through the apertures 68 on that side of the upper portion 14. In this way cut line 18 will align with the upper edge 26 of the side wall 30. With the joist 96 aligned against location tab 84 and held via the bearing arrangement 54, the bracket/joist assembly can be located from above the sill frame, to rest the first bearing plate 64 on the first sill 88 and the second bearing plate 62 on the second sill, arranged perpendicularly to the first sill.

If it is desired to use the bracket 10,100 as a restraint device, lips or overhanging sections are located on the far sides of the bearing plates 62,64 to engage the outer surface 102 of the sill 88 and a seat is located on the legs 38,40 of the side walls 30,32 to cradle a joist. The seat is positioned so that the distance between the seat and surface 86 of tab 84 is the height of the joist being used. As described previously, the bracket may be located first to the joist or to the sill. If location is first to the sill, the location tab 84 is bent out of the path of the joist while the joist is inserted into the bracket from above, noting that the barbs will have been pressed outwards or removed. Once in place, the tab is relocated and the joist can be brought up to meet the surface 86. Some adjustment is preferably left

on the seat position to ensure correct alignment of the joist against the tab. Alternatively, if the bracket is connected first to the joist, the bracket can be brought into the joist from an end so that the joist slides between the tab 84 and the seat until it abuts the back plate 12. When used as a
 5 restraint device the arrangement prevents the sill 88 being pulled away from the end 104 of the joist.

Reference is now made to Figure 4 of the drawings which illustrates a blank for constructing the bracket 100, generally indicated by reference
 10 numeral 106, according to an embodiment of the present invention. Like parts to those given in Figures 1 and 2 have been given the same reference numeral for ease of interpretation. Blank 106 is formed from a single sheet of metal. There are three distinct cutting areas, an upper 108, a lower 109 and a connecting area 110. These have been arranged so
 15 that the outline 112 of the upper area 108 fits within a recess 114 of the lower area 109. Such an arrangement reduces wastage in cutting from a sheet, without compromising the strength or operating features of the bracket 10. A gap 116 is created at cut line 18 by forming a cut away section to provide a length of the central portion 24 which does not extend
 20 laterally. This forms the connecting area 110. Such a gap 116 provides access to a user to fold the bracket.

The blank has machined through it, the apertures 68,70,50,56 as required. Care is taken to ensure apertures 56 are an obround holes and apertures
 25 50 are extruded holes. Cuts are made in the sheet around the apex 48 of each barb 46. The sheet is pressed to form strengthening ribs 42, 44, 72 these being raised portions in the metal. Surface cuts are also made to indicate fold lines 34,36,50,66,116,118. Once the blank 106 is cut from the sheet metal, the bracket 10 is easily assembled by folding inwardly, by
 30 180 degrees, at lines 118 to form the strengthening ribs 72,74 on the

bearing plates 62,64; folding outwardly, by approximately 40 degrees, at fold lines 50 to form the four barbs 46; folding inwardly, by 90 degrees, at line 66 to align the bearing plates 62,64 with the upper portion 14 of the back plate 12; folding outwardly, by 90 degrees, at line 116, to form the tab 84 in an opposing direction to the bearing plates 62,64; and, folding outwardly, by 90 degrees, at lines 34,36 to form the side walls 30, 32 parallel to each other and perpendicular to the back plate 12.

The principle advantage of the present invention is that it provides a bracket for use on timber construction such as a decking platform which automatically aligns the surface of the joists with the surface of the surrounding supporting heading member or sill.

A further advantage of at least one embodiment of the present invention is that it provides a joist hanger suitable for use in corner arrangements.

A yet further advantage of at least one embodiment of the present invention is that it provides a joist hanger in which the load of the joist is carried in fasteners located through the joist and attached to the hanger.

A further advantage of at least one embodiment of the present invention is that it provides a method of constructing a decking or timber platform wherein the joist can be prefixed to the hanger to increase speed of construction.

Various modifications may be made to the invention described herein without departing from the scope thereof. For example, the terms bracket and joist hanger have both been used throughout the specification to suit those skilled in the art who may consider that a joist hanger must have a seat portion. Additionally, while fixed numbers of apertures have been

illustrated in the bracket/joist hangers, it will be appreciated that any number may be selected to suit the dimensions and loads of the joists, sills and brackets being used. Those skilled in the art will also appreciate that the features described can also be used for skewed and sloped hangers.

CLAIMS

1. A bracket for use in timber construction, the bracket comprising a continuous back plate for location against an inner wall of a supporting heading member; at least one bearing plate extending perpendicularly from the back plate in a rearward direction for location upon the supporting heading member; first and second side walls extending from opposing edges of the back plate in a forward direction for locating a joist there between; and a locating tab including a first surface against which a joist can be aligned, the locating tab being arranged adjacent to the at least one bearing plate in the forward direction.
2. A bracket as claimed in claim 1 wherein the locating tab includes an upper surface which is substantially co-planar to an upper surface of the at least one bearing plate.
3. A bracket as claimed in claim 1 or claim 2 wherein the side walls extend from a lower portion of the back plate and the back plate includes an extended upper portion to provide a larger surface area for attachment to the sill.
4. A bracket as claimed in claim 3 wherein the extended upper portion includes fold lines, so that the bearing plates may be positioned at a desired angle relative to the location tab.
5. A bracket as claimed in any preceding claim wherein the bracket includes one or more barbs arranged on an inner surface adapted to engage a joist when located against the surface in a first direction.

6. A bracket as claimed in any preceding claim wherein the bracket includes load bearing fixing means comprising a member arranged to extend from the first side wall through the second side wall
- 5 7. A bracket as claimed in any preceding claim wherein a lip is located at an end of the/each bearing plate opposite the back plate.
8. A joist hanger for supporting a joist against a bearing member or wall, the joist hanger comprising a back plate for location against the
10 bearing member; the back plate including two parallel fold lines crossing upper and lower portions of the back plate; at least two bearing plates extending perpendicularly from the back plate for location upon the bearing member; first and second side walls being folded lower portions of the back plate for locating a joist there between; and characterised in that
15 the upper portion of the back plate may be folded along at least one fold line in the same direction as the adjacent side wall so that the hanger can be used where the bearing member is arranged in a corner location.
9. A joist hanger as claimed in claim 8 wherein the joist hanger
20 includes a seat portion.
10. A joist hanger as claimed in claim 9 wherein the joist hanger includes a location tab.
- 25 11. A joist hanger as claimed in claims 8 to 10 wherein the joist hanger includes one or more barbs arranged on an inner face of the side walls.
12. A joist hanger as claimed in any one of claims 8 to 11 wherein the joist hanger includes load bearing fixing means comprising a member
30 arranged to extend from the first side wall through the second side wall.

13. A joist hanger for supporting a joist against a bearing member or wall, the joist hanger comprising a back plate for location against the bearing member with first and second side walls extending from opposing edges of the back plate for locating a joist there between and load bearing fixing means comprising a member arranged to extend from the first side wall to the second side wall, through the supported joist and thereby bear a majority of the load of the joist at the hanger.
14. A joist hanger as claimed in claim 13 wherein the member is a screw.
15. A joist hanger as claimed in claims 13 or claim 14 wherein an aperture is located through the first side wall through which the member passes and the aperture is extruded obround hole.
16. A joist hanger as claimed in claim 15 wherein an extruded round hole is arranged in the second hole opposite the aperture for receiving the member.
17. A joist hanger as claimed in any of claims 14 to 16 wherein the member is a self tapping screw.
18. A joist hanger as claimed in any of claims 13 to 17 wherein the joist hanger includes a seat portion.
19. A joist hanger as claimed in any of claims 13 to 18 wherein the joist hanger includes a location tab.

20. A joist hanger as claimed in any one of claims 13 to 19 wherein the side walls extend from a lower portion of the back plate and the back plate includes an extended upper portion with two bearing plates each extending from opposing ends of the upper portion.

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21. A joist hanger as claimed in claim 20 wherein the extended upper portion includes fold lines, so that the bearing plates may be positioned at a desired angle relative to the back plate.

10 22. A joist hanger as claimed in any one of claims 13 to 21 wherein the joist hanger includes one or more barbs arranged on an inner face of the side walls.

15 23. A blank for a bracket, the blank comprising a single sheet metal section to form the bracket according to any one of claims 1 to 7.

24. A blank for a joist hanger, the blank comprising a single sheet metal section to form the joist hanger according to any one of claims 8 to 22.

20 25. A method of constructing a timber platform, the method comprising the steps:

- (a) providing at least one joist and a plurality of brackets according to the first aspect;
- (b) inserting each end of a joist between the side walls in a respective
25 bracket;
- (c) abutting the joist with each location tab;
- (d) affixing the joist to each bracket;
- (e) dropping the joist between supporting heading members so that the brackets locate against the members; and
- 30 (f) locating timber boards over the joist and header members.

26. A method as claimed in claim 25 wherein the method includes the step of bending a side wall through 90 degrees and thereby arranging the bracket in a corner of the sill frame.

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27. A method as claimed in claim 25 or 26 wherein the method further includes the step of hanging a bracket over the sill frame such that the back plate is against an inner face of the sill and the lip against an outer face of the sill.

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28. A method as claimed in claim 27 wherein the method further includes the step of affixing a handrail, post or other enclosure upon the sill.

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29. A method as claimed in claims 25 to 28 wherein the method includes the step of locating a self tapping screw through the side walls and the joist to thereby bear the load of the joist upon the screw.

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Claims searched: 1-29

Date of search: 16 November 2007

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
A		GB2301603 A (ANDREWS)
A		GB2228955 A (HARRIS et al.)
A		US4498801 A (GILB)

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
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Field of Search:

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E04B; E04C; E04G; F16B

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC

International Classification:

Subclass	Subgroup	Valid From
E04B	0001/26	01/01/2006
E04B	0007/04	01/01/2006