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AUSTRALIA  
Patents Act 1990

**PATENT REQUEST : STANDARD PATENT**

We, being the person identified below as the Applicant, request the grant of a patent to the person identified below as the Nominated Person, for an invention described in the accompanying standard complete specification.  
Full application details follow.

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[70] Nominated Person John Lysaght (AUSTRALIA) LIMITED A.C.N. 000 011 058  
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[54] Invention Title "VALLEY ROOF GUTTER CONSTRUCTION"

[72] Name(s) of actual inventor(s) David William HUMPHREY

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ASSOCIATED PROVISIONAL APPLICATION(S) DETAILS

[60] Application Number(s) and Date(s) PK 4633 dated 15 February 1991

Drawing number recommended to accompany the abstract Figure 2 .

Signature JOHN LYSAGHT (AUSTRALIA) LIMITED

Date 14 February 1992

by *Robert G. Shelton*

Fellow Institute of Patent Attorneys of Australia  
of Carter Smith & Beadle

File: 5134 Fee \$160.00

8027470 14/02/92

**NOTICE OF ENTITLEMENT  
FOR A PATENT OR PATENT OF ADDITION**

In support of the Application made by **JOHN LYSAGHT (AUSTRALIA) LIMITED**  
(A.C.N. 000 011 058) for the grant of a patent for an invention entitled:

**VALLEY ROOF GUTTER CONSTRUCTION**

I, **GREGORY JOHN DUFF**, of 55 Sussex Street, Sydney, New South Wales state  
as follows:

- (1) I am authorised by **JOHN LYSAGHT (AUSTRALIA) LIMITED** to make  
this statement on its behalf.
- (2) **DAVID WILLIAM HUMPHREY** of 2 Cato Place, Illawong, New South  
Wales, Australia is the inventor of the invention and the facts upon which  
**JOHN LYSAGHT (AUSTRALIA) LIMITED** (the nominated person) is  
entitled to the grant of the patent, are as follows:

If a patent were granted for the invention **JOHN LYSAGHT  
(AUSTRALIA) LIMITED** would be entitled to have the patent  
assigned to it.

Dated: ..... 18th February ..... 1992



To: THE COMMISSIONER OF PATENTS



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**(12) PATENT ABRIDGMENT**      **(11) Document No. AU-B-10982/92**  
**(19) AUSTRALIAN PATENT OFFICE**      **(10) Acceptance No. 637740**

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- (54) Title  
**VALLEY ROOF GUTTER CONSTRUCTION**
- International Patent Classification(s)  
(51)<sup>5</sup> **E04D 013/04**      **E04D 013/06**
- (21) Application No. : **10982/92**      (22) Application Date : **14.02.92**
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- (71) Applicant(s)  
**JOHN LYSAGHT (AUSTRALIA) LIMITED**
- (72) Inventor(s)  
**DAVID WILLIAM HUMPHREY**
- (74) Attorney or Agent  
**CARTER SMITH & BEADLE , PO Box 296, FIVE DOCK NSW 2046**
- (56) Prior Art Documents  
**AU 577132 44824/85 E04D 13/06**  
**AU 19784/67 E04D 13/06**

(57) A shallow V-sectioned gutter trough (10) comprises a lower, coated steel layer (14) furnished with a plurality of longitudinally extending, upwardly projecting, flat topped stiffening ribs (16) and longitudinal edge flanges (15), a plain upper layer (17) resting on the tops of the ribs (16), and fastening means, comprising hold down clips (20) and fasteners (19), securing said layers together; the upper layer (17) substantially covers the lower layer (14) and projects beyond one end thereof and the entire trough is adapted to function as a roof frame member supporting a plurality of tile battens (7).

Figure 1 is a perspective view of a portion of a steel roof frame showing a valley gutter incorporating a gutter trough according to the invention.

Figure 2 is a cross-sectional view taken on line 2-2 of figure 1, drawn to a larger scale.

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AUSTRALIA  
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**ORIGINAL  
COMPLETE SPECIFICATION  
STANDARD PATENT**

Invention Title: VALLEY ROOF GUTTER CONSTRUCTION

The following statement is a full description of this invention, including the best method of performing it known to the Applicant:-

This invention relates to valley gutters of the kind provided at the internal corner intersection of two non-aligned parts of a pitched roof.

The valley gutter normally extends from a high point or ridge of the roof to a perimeter gutter at the edge of the roof. Thus, rain water received by the valley gutter from the roof cladding on either side of it, is fed into the perimeter gutter, which, in turn conducts that water to a down pipe. Typically, the perimeter gutter is affixed to the outer, vertical face of a fascia plate extending along the edge of the roof to enhance the appearance of the roof.

A prior proposal for the construction of a valley gutter in a steel framed roof is described in the complete specification of Australian

patent No. 577132. The primary advantage of that gutter is its duality of function, in that it serves both as a roof structural element and as a drain.

The gutter described in that specification suffers from a number of  
5 disadvantages in practice:—

(a) It is essentially a structural component of the roof and is preferably built into the roof by the steel worker erecting same. This can cause on-site friction between personnel, as roof gutters are normally installed by a plumber who bears the responsibility for the effective drainage of the roof.  
10

(b) So that the roof cladding may also discharge rainwater directly into the perimeter gutter, the cladding must project over the top of the fascia plates and is usually supported thereon. Therefore, it is desirable for the fascia plates to be installed with their top edges high enough to meet the under side of the projecting cladding. Where the cladding comprises rows of overlapping cladding elements, this calls for the top edges of the fascia plates to be above the plane defined by the top faces of the tile support battens by an amount equal to the effective thickness of the cladding elements at the battens. It follows that the lowest part of the trough body of the prior art valley gutter fouls the top of the fascia plates and has to be bent up by the plumber to enable it to clear them and discharge into the perimeter gutter. If the cladding elements are concrete or terra-cotta tiles this may require quite  
15  
20  
25 significant deformation of the valley gutter. Because the prior art gutter referred to is a structural member it is relatively thick and

difficult to bend up as needed. This does nothing to reduce the likelihood of friction mentioned in (a).

- 5 (c) Should the gutter become perforated, due to corrosion or otherwise, water may leak from it directly onto the ceiling of the room under the roof. This may cause staining or other permanent damage before the leak is observed and rectified.

10 Therefore, an object of the present invention is to overcome or alleviate the above indicated disadvantages of the prior art while retaining the advantage of a gutter trough adapted to function as a structural component of the roof.

15 The invention achieves that object by providing a double layer gutter trough comprising a lower layer furnished with a plurality of longitudinally extending, upwardly projecting stiffening ribs, a plain upper layer resting on the tops of the ribs of the lower layer, and fastening means securing said layers together; said upper layer substantially covering said lower layer and projecting beyond one end thereof.

By way of example, an embodiment of the above described invention is described in more detail below with reference to the accompanying drawings.

20 Figure 1 is a perspective view of a portion of a steel roof frame showing a valley gutter incorporating a gutter trough according to the invention.

Figure 2 is a cross-sectional view taken on line 2-2 of figure 1, drawn to a larger scale.

The partial roof frame of figure 1 comprises two portions 5 and 6, each for sections of tile clad, pitched roof meeting at an internal 90° corner. Roof portion 6 comprises a top wall plate 3 supporting three roof trusses with top chords 4 and a plurality of tile support battens 7.

5 Roof portion 5 comprises a similar truss with top chord 8 and a saddle truss with top chord 9. Both portions of the roof would normally be fully sarked, but only a fragment of a sarking membrane 11 interposed between the top chords 4 and 5 is shown, to enable the roof structure to be better seen. Likewise only a few of the roof's cladding tiles 12 are shown.

10 The lower edges of the roof portions 5 and 6 are finished with fascia plates 13.

As can be seen the planes defined by the upper surfaces of the respective top chords 4, 8 and 9 intersect in an inclined line, being in the vertical centre plane of a valley gutter trough 10. The fascia plates 13

15 also intersect in that centre plane.

The gutter trough 10 comprises a ribbed lower layer 14 of a generally shallow V-shaped cross-section and a plain upper layer 17 of a shallow V-shaped cross-section. Both layers may be cold roll-formed from sheets of steel coated with a coating containing zinc.

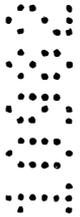
20 The lower layer 14 is furnished with two longitudinal edge flanges 15 and six, longitudinally extending, upwardly projecting, flat topped, stiffening ribs 16. By virtue of its thickness and ribbed formation it is able to function as a continuous beam spanning the roof trusses (or the corresponding rafters in other roof constructions) and carry the end

25 parts of the tile battens 7 which are fixed to its flanges 15 by conventional fasteners 18. The lower layer itself is fixed to the top chords by similar fasteners 19.

The upper layer 17 rests upon the flat tops of the ribs 16 and may be secured to the lower layer 14 by hold down clips 20 and fasteners 21 or other conventional means. For preference the fasteners are such that the upper layer is not pierced thereby. Once secured to the lower layer 14, the upper layer 17 contributes markedly to the beam strength of the gutter trough as a whole.

It will be seen that the bottom end of the lower layer 14 stops short of the fascia plates 13, whereas the upper layer 17 extends beyond that end of the lower layer and projects over the top edge of the fascia plates at 22.

Because of the depth of the lower layer 14, due to the ribs 16, the upper layer 17 either clears the fascia plates or may be readily deformed by the plumber to do so, in customary manner. Furthermore, the upper layer 17 may be of light gauge material which, of course, facilitates such bending.



## THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A gutter trough comprising a lower layer furnished with a plurality of longitudinally extending, upwardly projecting stiffening ribs, a plain upper layer resting on the tops of the ribs of the lower layer, and fastening means securing said layers together; said upper layer substantially covering said lower layer and projecting beyond one end thereof.
- 5
2. A gutter trough according to claim 1 wherein the fastening means comprise a plurality of hold down clips engaging over the edges of the upper layer and fixed to the lower layer by fasteners which do not pierce the upper layer.
- 10
3. A gutter trough according to either claim 1 or claim 2 wherein the ribs of the lower layer are flat topped.
4. A gutter trough according to any one of the preceding claims wherein said lower layer comprises longitudinally extending laterally projecting edge flanges adapted to support the ends of tile battens.
- 15
5. A building roof frame incorporating a gutter trough according to any one of the preceding claims as a structural element spanning spaced apart supporting members and itself supporting a plurality of battens.
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6. A gutter trough substantially as described herein with reference to the accompanying drawings.

Applicant JOHN LYSAGHT (AUSTRALIA) LIMITED

Date 14 February 1992

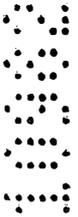
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of CARTER SMITH & BEADLE



## ABSTRACT

A shallow V-sectioned gutter trough (10) comprises a lower, coated steel layer (14) furnished with a plurality of longitudinally extending, upwardly projecting, flat topped stiffening ribs (16) and longitudinal edge flanges (15), a plain upper layer (17) resting on the tops of the ribs (16), and fastening means, comprising hold down clips (20) and fasteners (19), securing said layers together; the upper layer (17) substantially covers the lower layer (14) and projects beyond one end thereof and the entire trough is adapted to function as a roof frame member supporting a plurality of tile battens (7).

Figure 2.



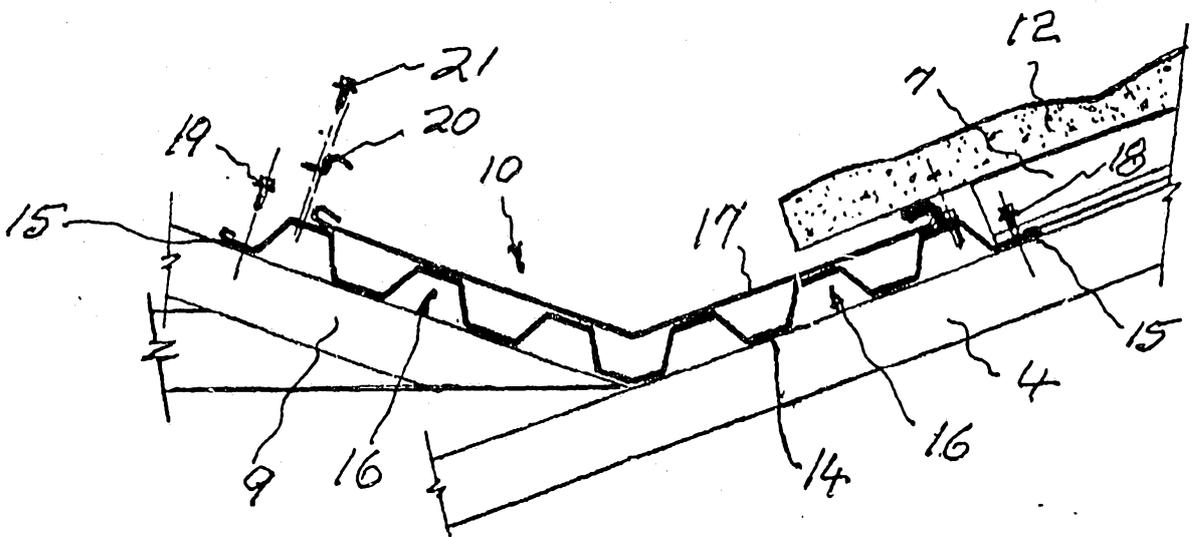
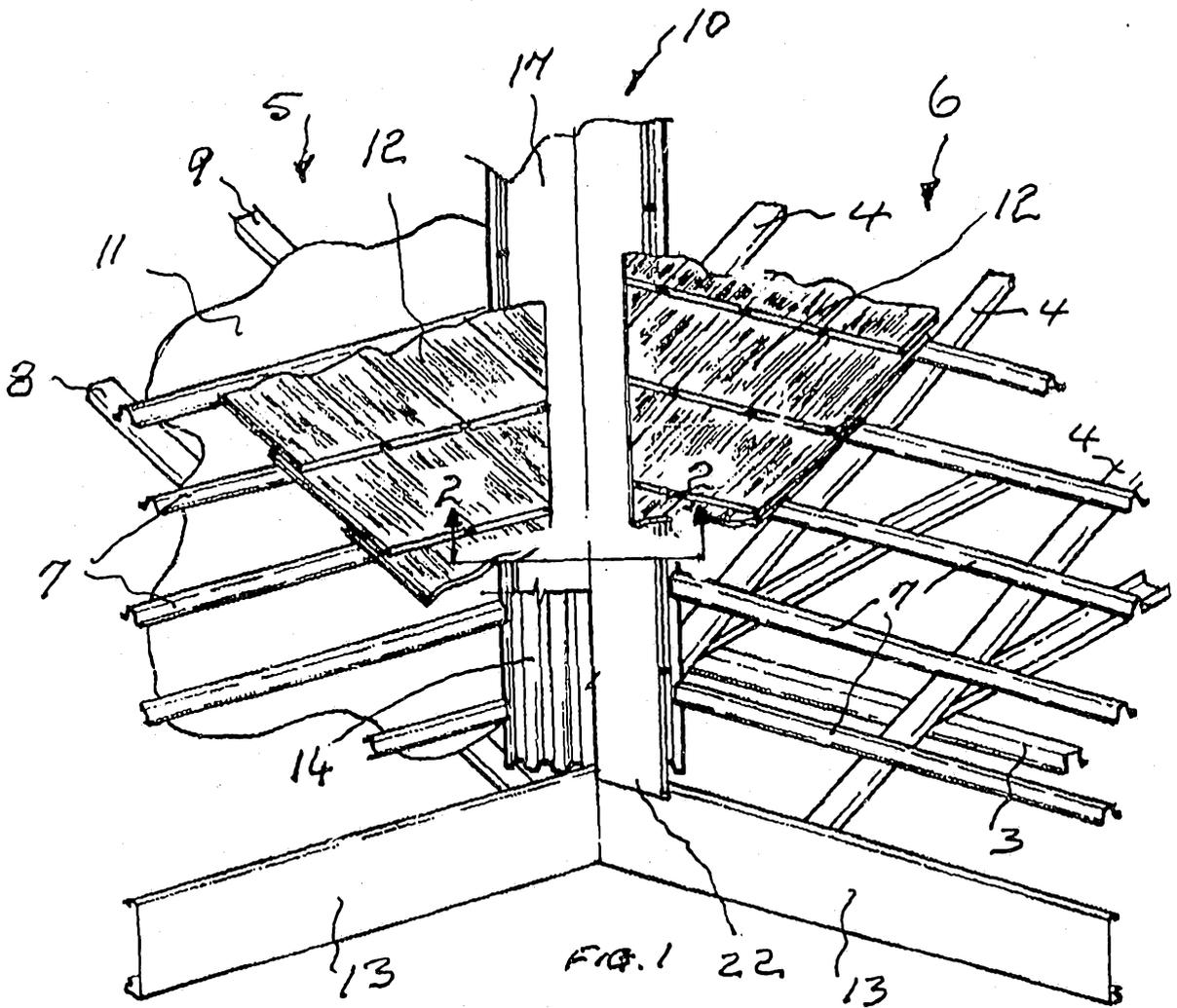


FIG. 2.