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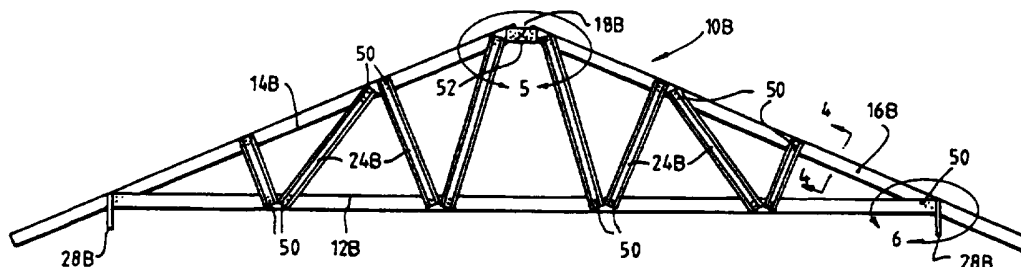
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(54) Title: BUILDING TRUSS



(57) Abstract

The invention provides a building truss (10B, 58) having top and bottom chords (14B, 16B, 12B; 14C, 16C, 60, 62) with struts (24B; 24C) linking the chords. The chords and struts are formed of metal sections secured together by threaded fasteners (50; 50C).

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BUILDING TRUSS

The present invention relates to a building truss.

Building trusses are typically triangular in shape with a bottom chord and two angled top chords meeting at an apex to define the roofline. The top and bottom chords are linked by struts which criss-cross the triangular profile. All trusses are usually similar in shape but made from different materials i.e. timber and steel. Figs. 1 and 2 illustrate prior art trusses with Fig. 1 showing a steel truss and Fig. 2 showing a wooden truss.

In Fig. 1 truss 10 comprises a bottom chord 12 and top chords 14,16 angled to form apex 18. The chords 12,14,16 are formed from Z-shaped profile steel members. Top chords 14,16 abut at apex 18 and are welded together. Bottom chord 12 is welded to top chords 14,16 respectively at 20,22. Struts 24 link top chords 14,16 to bottom chord 12 and are secured by welding. Struts 24 are typically of a U-shape profile. Strengthening plates 26 are welded at the opposing corners of truss 10. Connection elements 28 are welded to truss 10 to allow attachment to the wall top plate/stud (eaves).

The problems associated with this type of truss are numerous. The truss must be prefabricated off-site and transported. Transportation can involve damage to the truss. The manufacture is very labour intensive and can be dangerous. Welding involves fumes and a dirty environment which contributes to accidents. Welding equipment must also be available on-site to repair any transportation damage.

In Fig. 2 similar integers to those in Fig. 1 are referenced with an "A" suffix to avoid repetition of description. Truss 10A has top chords 14A,16A; bottom chord 12A and struts 24A formed from timber members. The struts 24A abut against the inner faces 30,32 of top chords 14A,16A and inner face 34 of bottom chord

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12A. The truss 10A is set up in a jig (not shown) and secured together by clinches 36 on both sides of the truss.

The truss 10A in Fig. 2 has problems in that again it must be prefabricated in a factory and brought to the site in its assembled form. Broken clinches are often not noticed until tiles are applied. Accordingly, an expensive portable clinching gun must be available at the site.

It is an object of the present invention to provide a truss which will overcome or minimise the abovementioned problems.

10 A further object of the invention is to provide a truss which can be supplied in an unassembled form to a site.

Yet another object of the invention is to provide a steel truss which requires no welding.

15 With these objects in view the invention in a preferred aspect may provide a building truss including top and bottom chords and struts linking said chords, said chords and struts being formed of metal sections and secured together by threaded fasteners.

20 Preferably said chords and struts are formed of C-shaped sections and are secured together by screws. In a preferred embodiment the adjacent ends of the chords are coupled together by a link bridging said adjacent ends and is screwed to said adjacent ends. Preferably said link is formed of a C-shaped metal section.

25 These and other aspects of the present invention will be more fully described with reference to the accompanying drawings, in which:-

Fig. 1 is a side view of a prior art steel truss;

Fig. 2 is a side view of a prior art wooden truss; and

30 Fig. 3 is a side view of a first embodiment of a truss made in accordance with the invention;

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Fig. 4 is a cross-sectional view along and in the direction of arrows 4-4 shown in Fig. 3;

Fig. 5 is an enlargement of the area circled by 5 in Fig. 3;

Fig. 6 is an enlargement of the area circled by 6 in Fig. 3,

5 and

Fig. 7 is a side view of a second embodiment of a truss made in accordance with the invention.

In order to avoid repetition of description, similar integers in Figs. 3 to 6 to those in Fig. 1 are referenced with a "B" suffix.

10 In Fig. 3 truss 10B is formed of C-shaped metal sections which have a flat base 40 and right angled sides 42,44. Right angle lips 46,48 are located opposite one another. The bottom chord 12B, top chords 14B,16B and struts 24B are all formed from the same shaped metal section. The prior art truss shown in Fig. 1 has
15 differing profiles for the chords and struts. The C-shape profile is stronger than the Z-shaped profile. The top chords 14B,16B do not have their apex ends abutting as in the prior art. They can touch or not touch depending on requirements. The flat base 40 of each chords 12B, 14B, 16B all face the same direction.

20 Struts 24B are not welded to chords 12B,14B,16B but are secured by threaded fasteners 50 by abutting respective flat bases 40. It has been found that self drilling screws, for example, TEK screws are the preferred securing means. Nuts and bolts could also be substituted. The TEK screws are preferred because they
25 are self drilling screws with a screw washer head that are readily available and are dispensed with an easy to use gun e.g. SCRUGUN® power screwdrivers by BLACK & DECKER. At apex 18B a link 52 bridges the adjacent ends of top chords 14B,16B. Link 52 is of the same profile as chords 14B,16B and is secured by
30 screws 50. Link 52 is secured parallel to bottom chord 12B and is positioned to optimise the loading on the truss. The number of

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screws 50 used and positioned thereof can vary depending on loadings on the truss.

Bottom chord 12B has part of right angled sides 42,44 at either end removed to ensure that the flat base 40 thereof lies
5 against top chords 14B, 16B. This will provide an interlock when screws 50 are fastened thereto. Fig. 6 clearly illustrates this assembly.

The invention allows truss 10B to be supplied in a complete knock down (CKD) form or partly pre-assembled form
10 which substantially reduces transportation costs. As there is no bulky truss to be transported there is no damage sustained during transportation. The components of the truss can be cut to length prior to delivery on site and then assembled on site. The truss is readily assembled with a power screwdriver and easily repaired.
15 Dangerous welding equipment is not required and workplace safety is greatly improved. The cost of the assembled truss is substantially cheaper than the prior art welded trusses and similar in cost to the wooden trusses.

The embodiment shown in Fig. 7 illustrates the use of the
20 invention in a scissor truss 58. Again in order to avoid repetition of description, similar integers in Fig. 7 to those referenced in Figs. 3 to 6 are referenced with a "C" suffix. In this embodiment bottom chord 12B in Figs. 3 to 6 is replaced by chords 60, 62 which criss cross each other at 64. Again the flat bases of chords
25 14C, 16c, 60, 62 face the same direction with chord 60 having its right angled sides being cut out at 64 to allow the flat bases of chords 60, 62 to be affixed to each other by screws 50C. Similarly ends 68, 66 of chords 62, 60 respectively have their right angled sides cut to allow affixing to top chords 16C, 14C. Again
30 struts 24C will have their flat bases abutting the flat bases of chords 14C, 16C, 60, 62 to allow them to be fastened together by screws 50C.

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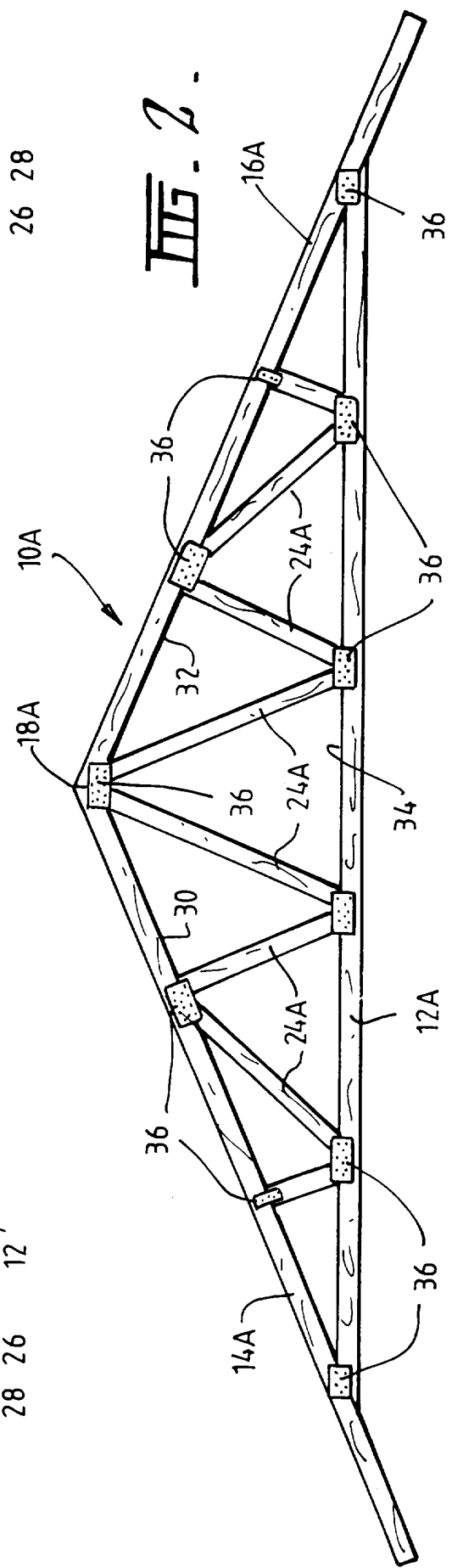
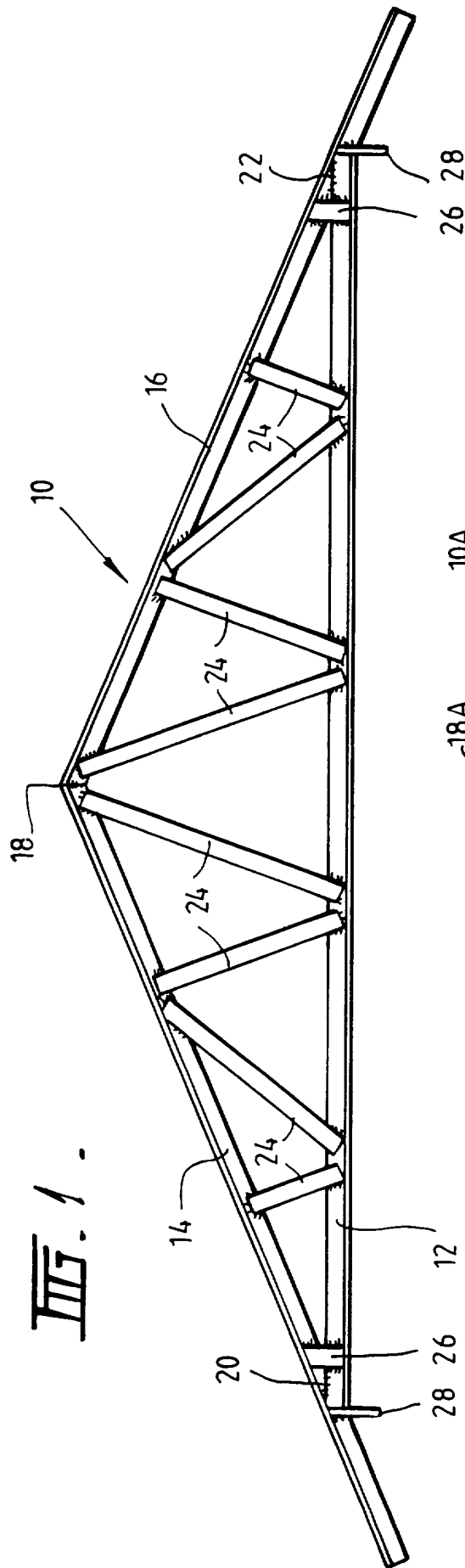
It is believed that the invention and many of its attendant advantages will be understood from the foregoing description and it will be apparent that various changes may be made in the form, construction and arrangement of the parts and that changes may
5 be made in the form, construction and arrangement of the trusses described without departing from the scope and spirit of the invention or sacrificing all of its material advantages, forms hereinbefore described being merely preferred embodiments hereof.

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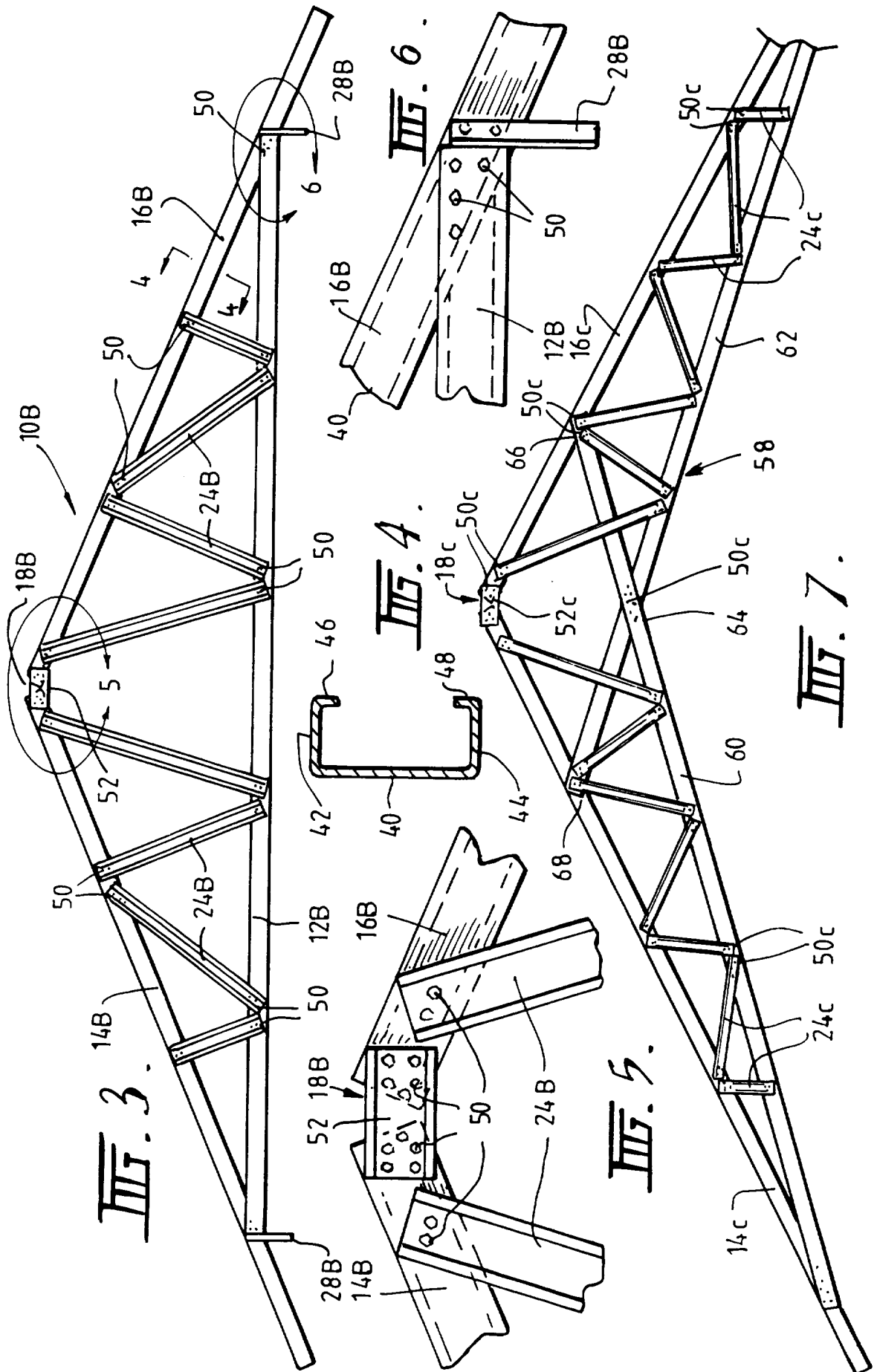
CLAIMS

1. A building truss including top and bottom chords and struts linking said chords, said chords and struts being formed of metal sections and secured together by threaded fasteners.
- 5 2. The building truss of claim 1, wherein said chords and struts are formed of C-shaped sections.
3. The building truss of claim 1 or 2, wherein said threaded fasteners are screws.
4. The building truss of claim 3, wherein said screws
10 are self drilling screws.
5. The building truss of any one of the preceding claims, wherein the adjacent ends of the top chords are coupled together by a link bridging said adjacent ends and is screwed to said adjacent ends.
- 15 6. The building truss of claim 5, wherein said link is formed of a C-shaped metal section whose base is secured to the respective bases of said top chords.
7. The building truss of claim 2, wherein the base of each C-shaped sections of said top and bottom chords face the
20 same direction with the base of each strut abutting the base of respective chords and are secured together at the abutting faces.
8. The building truss of any one of the preceding claims, wherein said truss is triangular with opposing top chords and a single bottom chord linking the free ends of said top chords.
- 25 9. The building truss of any one of claims 1 to 7, wherein said truss is a scissor truss, said bottom chords comprising a pair of criss-crossed chords, whereby one bottom chord bridges the free end of one of said top chords to a position on the other of said top chords and other bottom chord bridges the
30 free end of the other of said top chords to a position on said one of said top chords.

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INTERNATIONAL SEARCH REPORTInternational Application No.
PCT/AU 95/00506**A. CLASSIFICATION OF SUBJECT MATTER**Int Cl^B: E04C 3/08, 3/11

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: E04C 3/08, 3/11

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
AU : IPC as aboveElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Derwent**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	AU 10399/76 A (SEWELL) 28 July 1977 page 3 lines 5 - 29, Figure 4	1-9
X	AU 78228/91 (650881) B (UNIFRAMES HOLDINGS PTY. LTD.) 12 December 1991 whole document	1-9
X	WO 92/22716 A (HART) 23 December 1992 whole document EP 637656 A (MITEK HOLDINGS) 8 February 1995	1-9



Further documents are listed in the continuation of Box C



See patent family annex

* Special categories of cited documents:

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C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X, P	Figure 2 US 4435940 A (DAVENPORT) 13 March 1984	1-9
X	whole document US 4982545 A (STROMBACK) 8 January 1991	1-9
X	whole document AU 10787/52 (156229) B (STANDARD STEEL CO.) 21 May 1953	1-9
A	whole document AU 17454/70 (443203) B (TRUS JOIST CORPORATION) 13 January 1972	1
A	whole document AU 22354/53 (165422) B (HARDING) 12 August 1954	1
A	whole document	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

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This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member			
AU	10399/76				
WO	9222716	AU	21639/92		
EP	637656	AU	67438/94	CA	2128170
US	4435940				US 5457927
US	4982545	AU	60386/90	WO	9100944
AU	78228/91				
END OF ANNEX					