

ADVANCES IN VERTICAL TECHNIQUES

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Abstract

With the introduction of Petzl gear in early 1976 we have had to change our ideas on the application of vertical caving equipment. Of all the Petzl gear we have imported, the outstanding pieces have been the handled ascender and the Shunt. The attachment point of the ascender is directly below the rope channel and a cam locking mechanism is incorporated, these features greatly facilitate its use. The Shunt is an abseil protection device. It is held with the trailing hand when moving down the rope. If it is released the device locks onto the rope. A device has been developed in Central Queensland called the Etna descender as it was felt that a safer device was required.

Ascenders

The original Petzl ascender has been recently modified in several ways to make it easier to operate. It is pressed from high tensile aluminium with a cast aluminium cam. Handles have been provided, the bottom attachment point is directly below the rope channel and there is no horizontal twisting of the rope. These improvements are certainly effective for people who still use the "bicycle" method of prussiking. However, certain problems are encountered when using the "frog" method as the ascender does not sit right on the chest and becomes clumsy. We thought that we would overcome this problem with the introduction of the Croll ascender but this has not proved to be the case. Both the Petzl and the Croll ascenders have a load limit of 400 kg.

The cam in both the ascenders has also been modified and it is similar to the cam in the Jumar ascender with two exceptions:

- 1) there are many fewer teeth and they face downwards,
- 2) a mechanism is provided so that the cam can be locked in or out, passing knots becomes a one hand operation and the device can be operated by a gloved hand.

A number of people have experimented with the use of a handled Petzl as the top ascender and a Jumar as the bottom one. The Jumar follows more easily as it has a smaller rope channel. I have set up an ascender system using two of the new Petzls and a Croll. The system works well but has the disadvantage that tapes have to be tied to replace karabiner chains.

Descenders

The Shunt is a recent development in the abseil protection field much needed as most descending devices, once released, provided no protection in an uncontrolled descent. The Shunt is made from the same material as the Petzl ascender and is basically a channel through which a hole is drilled to take a pin. The pin carries a spring loaded lever. A piece of bar, which acts as a cam, is placed on the level and is forced against the back of the channel by the spring tension.

The weight of the operator is loaded onto the lever with the rope under the cam. This locks the device up. To release it the top of the Shunt is pulled down. During the abseil the device is held down by the trailing hand. A tape is attached to the end of the lever and tied to a Whillans or similar harness. As one slides down, the attachment tape is held loosely by the trailing hand. As soon as the Shunt is released the spring pressure holds it stationary on the rope, as one's weight goes onto the attachment tape the device locks up and stops the uncontrolled descent.

Two members of the Central Queensland Speleological Society have recently developed a device called the Etna descender as it was considered that no safe abseil device was then available. It is based on the design of the Stich plate but the mode of operation is completely different. To move, the end of the Etna remote from the rope is pulled down, normally by one hand only (Plates 4 and 5); to stop, one merely releases the device. The production version has the same limitations on the length of the pitch as does the Stich plate. The dimensions of the device, for which an Australian patent application has been made, are shown in the figure (Fig. 1).

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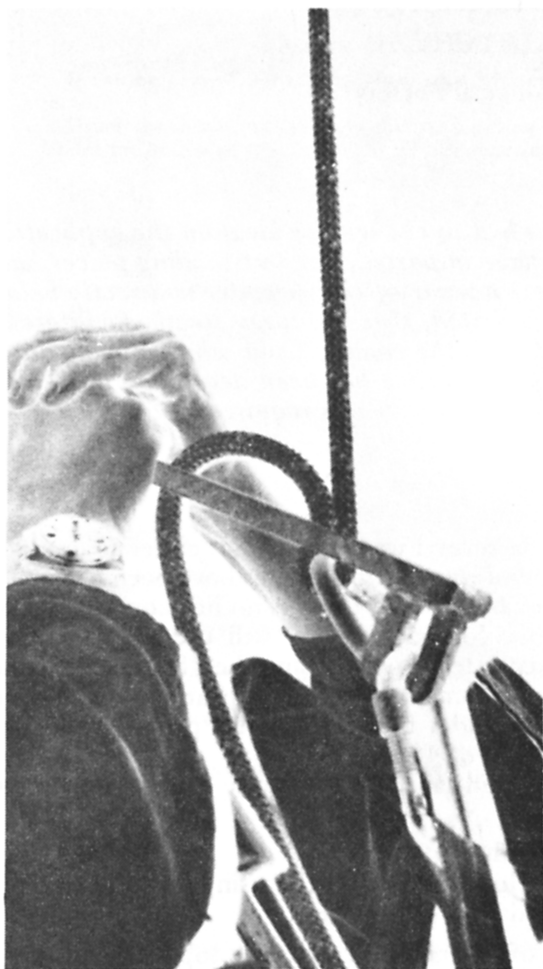


Plate 4. The Etna Descender; descending.

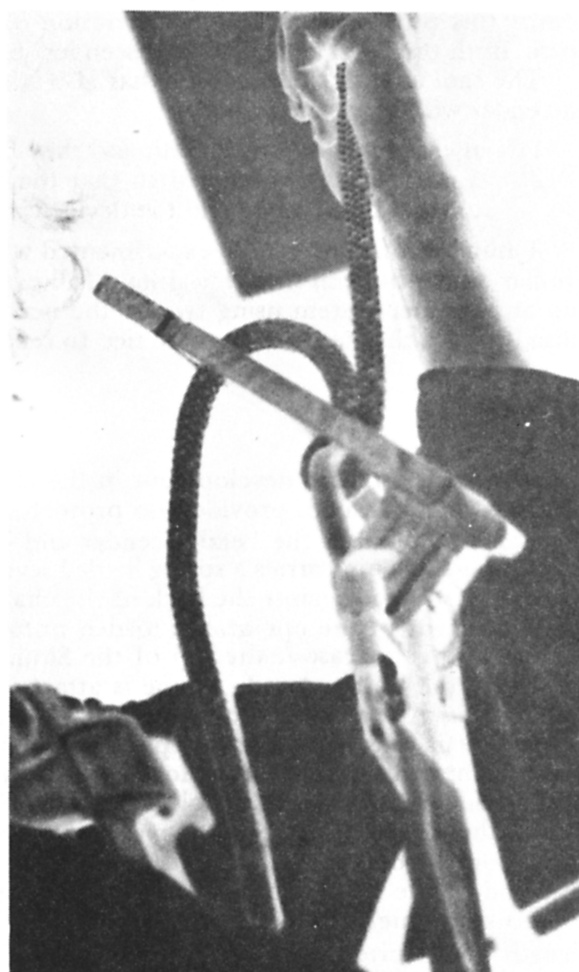


Plate 5. The Etna Descender; stationary.

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The Etna descender is constructed from a medium tensile aluminium alloy (BS083 TH321). The ultimate tensile strength (UTS) of the alloy is 40 000 psi and it has a yield point of 18 000 psi. The original version was welded to make the T section, the weld used has a UTS of 38 000 psi and a yield point of 18 000 psi. The alloy is, however, available as a T section in the required dimensions but the availability of strip or section is unknown. It is used to make some railway waggons in Queensland! Sophisticated equipment such as M.I.G. argon arc welders, ultrasonic flaw detectors and other uncommon equipment are necessary to produce the welded version.¹

Editors note :

- ¹ The reader is encouraged to note Bosler's comments (p. 65, this volume) on the safety of amateur construction of vertical caving equipment.

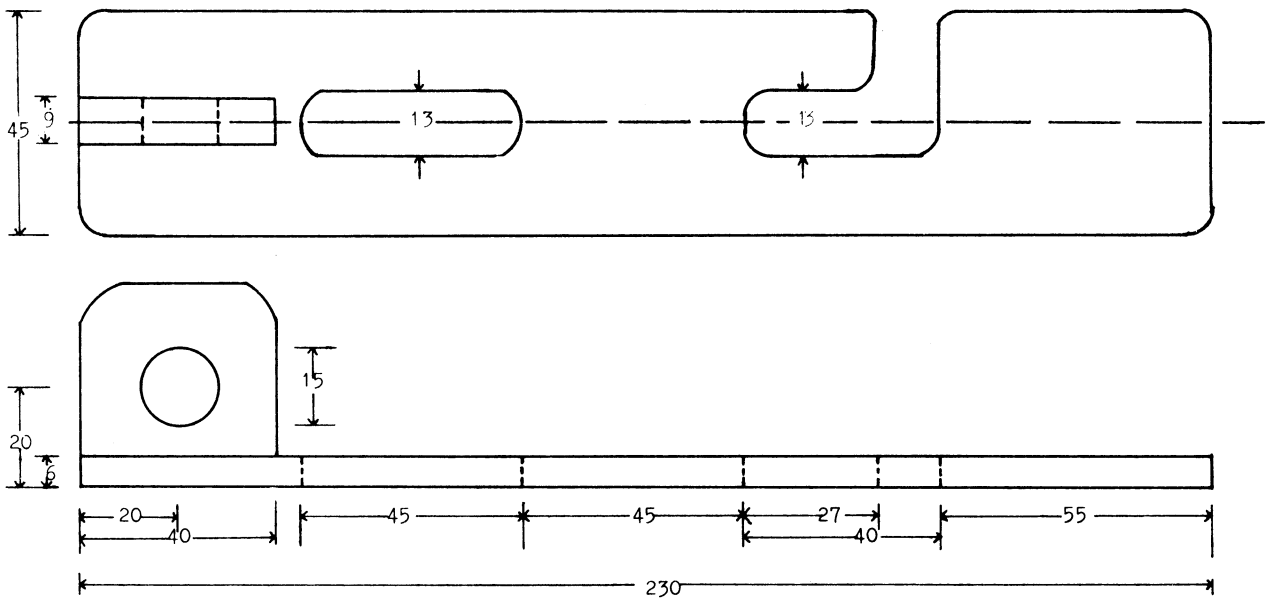


Fig. 1. The Etna Descender (all dimensions in millimetres).