Ben 2 and Ben 3 – Fuelwood Stoves
Annex F)
Rack for Ben-Stoves as Workspace

http://solarcooking.wikia.com/wiki/Ben_3_Firewood_Stove

The stove Ben 3 on Fig. F1 is placed on a shelf (rack) with a height of about 30cm. This allows the Ben-stove to be fueled comfortably and the pot is easy to operate. The shelf height of 33cm is convenient for operation. The rack shown by the picture is produced from prefabricated components. A simple rack , produced with 2 steel sheets and 4 threaded bolts, is shown on the next pages.

The picture also shows two thermos flasks and a thermos-basket for cooking with retained heat (thermos technology), which is described in detail at:
http://solarcooking.wikia.com/wiki/Heat-retention_cooking).
In the case of a transition from a fuel consumption of 100 kg (100%) with a three-stone fireplace with 10% efficiency to the Ben-stove with 40% efficiency and with an additional saving of 45% by means of the thermos technology, the consumption is reduced to 14 kg (= 1/7), corresponding to a saving of 86%. Further savings are possible by solar cookers, which are also suitable for additional applications (baking, preserving etc.). The small amount of residual fuel still required can be obtained from "short rotation plantations" with annual harvest (e.g., pigeon peas). Thus no tree has to be felled for firewood or charcoal.

Alternative designs are depicted on the following pages. It is an open source appropriate technology (OSAT). Of course, liability is excluded.

Fig. F1   Shelf (rack) as workspace for Ben-stove
Upper platform 30 cm high, surface 50cm x 50cm

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Fig. F2   Workplace for Ben-stove on a rack with two platforms held by four threaded bolts with alternative pieces for fastening the platforms on the bolts: nuts, self-locking nuts, washers and the (preferred) serrated nuts. Tubes passed by the bolts are also possible.
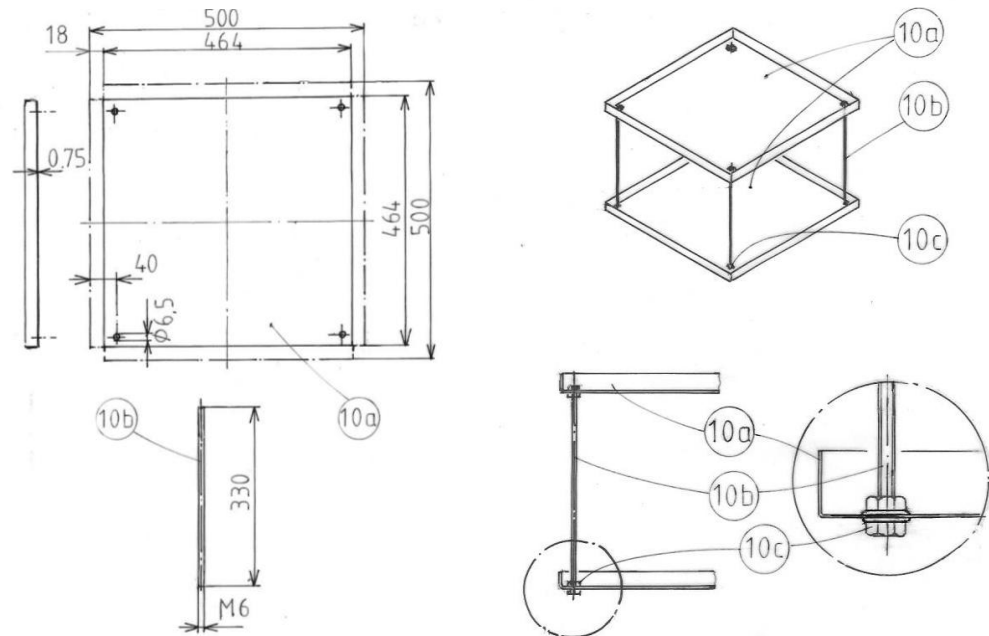
Fig. F3   Drawings for a simple rack for supporting a Ben-stove, according to the list of pieces and the description on page F3.

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Item Number	Quantity of Pieces	Item	Drawing./ standard	Material	Thickness or diameter	Width	Length	Cross section	Weight per part	Total weight
List of Pieces for Rack Annex F)			Oct. 2017	Dr.-Ing. Dieter Seifert						
to support Ben-stoves Ben 2 or Ben 3										
					mm	mm	mm	mm²	kg	kg
10a	2	Steel plate for platform	Annex F)	mild steel	0,75	500	500	375	1,463	2,925
10b	4	Threaded bolt M6	Annex F)	galvanized steel	6		330	28	0,073	0,291
10c	16	Serrated nut M6	Annex F)	galvanized steel					0,0031	0,050
										3,27

Alternatives: 16 ordinary nuts M6 with 16 washers, or self locking nuts with washers; bolts with distance tubes; M8 bolts instead of M6 bolts

The rack depicted on page F2 for Ben-Stoves (Ben 2 or Ben 3) requires two squares of steel plates (10a) with an edge length of 500mm and 0.75mm thickness. At the corners, small squares with an edge length of 18mm are cut off so that edges with a width of 18mm can be bent on all sides. The result are rigid platforms and the upwards bent edges prevent the tripod of the Ben-stove from slipping off.

Before bending, 4 holes for the threaded bolts are drilled. After bending, the two platforms of the rack are screwed together with 4 threaded bolts (10b) and 16 nuts M6 (10c).

The height of the upper platform is assumed to be at about 30cm, so that the fire and the pot or the pan can be served sitting on a chair. But other heights may be preferred by the cooks; the design can be adapted accordingly. If only one low shelf is desired, it is possible to use M8 screws (e.g. with 40mm length) as legs, which are fastened to the platform with 8 nuts. This is a cheaper design, because one shelf is omitted, but the operation may be less comfortable.