How to build a bicycle ambulance

PEOPLE often die because they cannot get help quickly enough.

Mothers and babies die in childbirth because they are too far from a skilled attendant. Men suffering wounds from fighting or from an accident at work bleed to death because they cannot get to a hospital quickly enough. People suffering from life-threatening sicknesses sometimes die because transport to find help was not available or they could not afford it.

Practical Action

This design of bicycle ambulance is similar to those shown on this page. It is a good idea to put mats or cushions in the trailer to make it more comfortable for passengers.

One idea to meet Millennium Development Goals 4, 5 and 6 is to improve local transport. These designs for bicycle trailers can be used to build bicycle ambulances which can carry around 200 kilograms. The ambulances are large enough for at least one person to sit in.

The cycle trailers are made from iron tubing, which is cut, bent, welded and drilled to make the frame and wheels. The frame needs to be strong and rigid but as light as possible. Thin wall tube gives the best design but is not always available or affordable and some skill is needed to weld thin material.

OTHER USES

The trailers can also be used for:

- transporting goods, fuel, water and crops
- mobile shops
- mobile libraries
- bicycle taxis.

DETAILS OF THE FRAME CONSTRUCTION

FIGURE 1

A design using wire mesh.

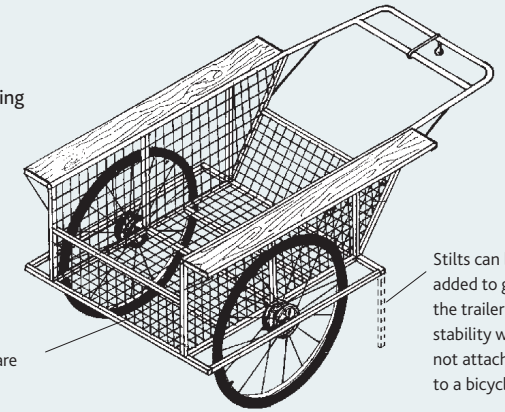
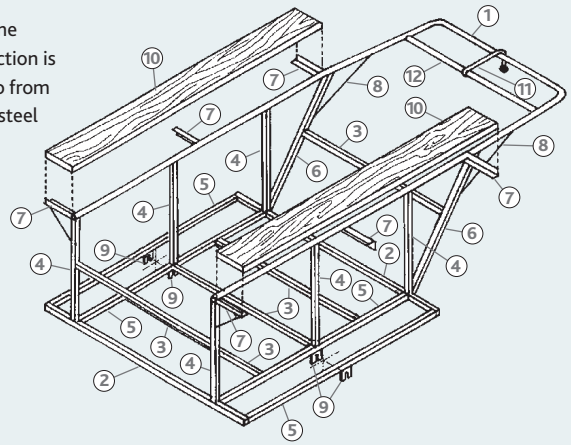


FIGURE 2

The frame construction is made up from welded steel tube.



The components of the frame are listed here.

Part no	Description	Quantity	Material	Semi-finished dimensions (in approximate mm)
1	Round tube	1	Mild steel	○ 19 x 2713
2	Square tube	2	Mild steel	□ 19 x 914
3	Square tube	5	Mild steel	□ 19 x 623
4	Square tube	6	Mild steel	□ 19 x 382
5	Square tube	4	Mild steel	□ 19 x 877
6	Square tube	2	Mild steel	□ 19 x 445
7	'L' angle	6	Mild steel	L 19 x 19 x 125
8	Rod	2	Mild steel	● 09 x 240
9	Wheel mounting	4	Mild steel	— 51 x 51 x 6
10	Plank	2	Wood	873 x 126 x 15
11	Hitch (male)	1	Mild steel	–
12	Round tube	1	Mild steel	○ 19 x 560

FIGURE 3

Alternative frame constructions can be used depending on materials and the production equipment available. Figure 3 shows an alternative frame design made from tubular bar.

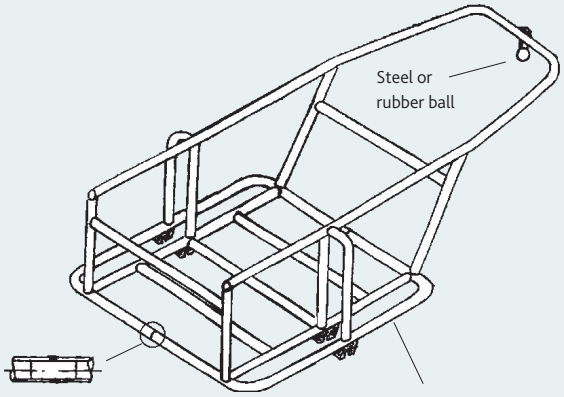
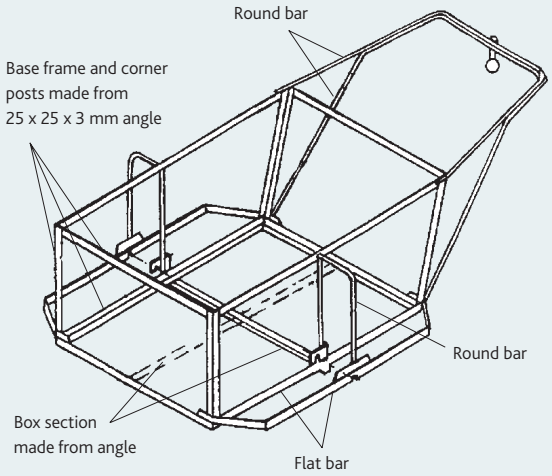


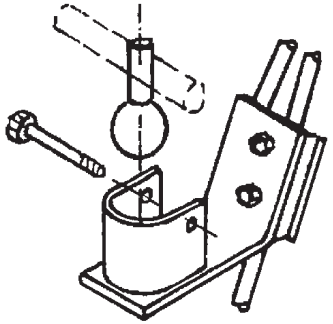
FIGURE 4

This shows a frame that can be made from angle and bar.



HITCH

Although hitching a trailer at the level of the rear axle has the least effect on the stability of the bicycle, hitching above the rear wheel – to the carrier or to the frame below the seat – is simpler. If you choose this option it is easier to use the trailer as a hand cart as well.



Hitch design. A steel or rubber ball drops into a socket formed from a flat bar or cut from a pipe bolted to the carrier or frame of the bicycle.

This method has been widely tested on earth roads and tracks in various countries and has caused no problems for the trailer users. Various hitch mechanisms may be used. Make sure:

- they are strong and durable
- they do not constrain relative movement between the bicycle and the trailer.

The best mechanism is a rubber ball in a steel socket attached to the carrier or the rear wheel stays, but you can simply tie the trailer to the carrier.

WHEELS

Normal bicycle wheels are suitable for light loads on good roads but are not strong enough for carrying heavy loads or for use on rough tracks. In some areas you may be able to buy strengthened wheels that take standard bicycle tyres for use on more uneven road surfaces.

With thanks to Practical Action. The information in this article has been taken with permission from Practical Action's technical brief on bicycle trailers, which can be downloaded from the Practical Action website.

www.practicalaction.org

http://practicalaction.org/docs/technical_information_service/bicycle_trailers.pdf